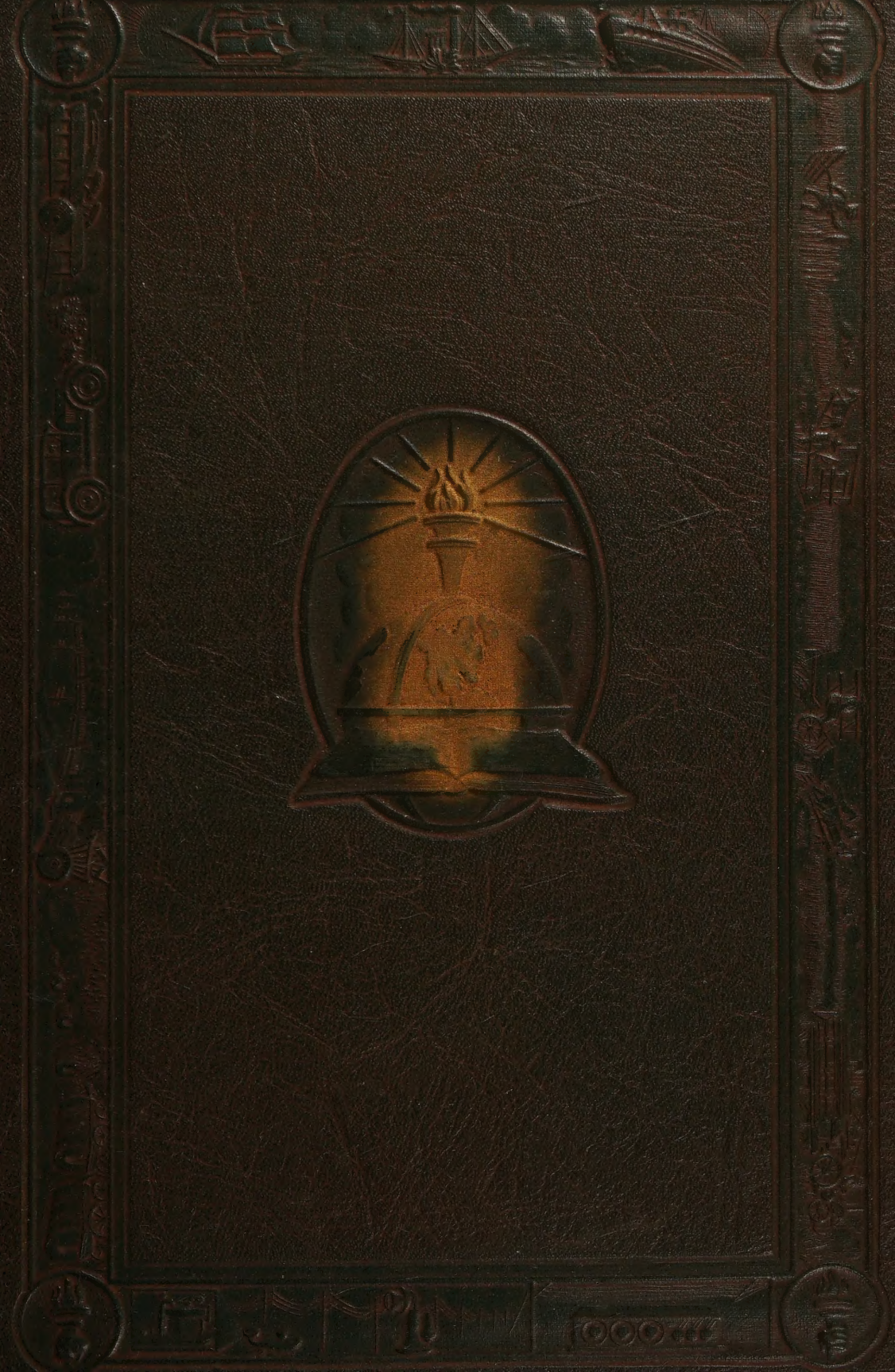

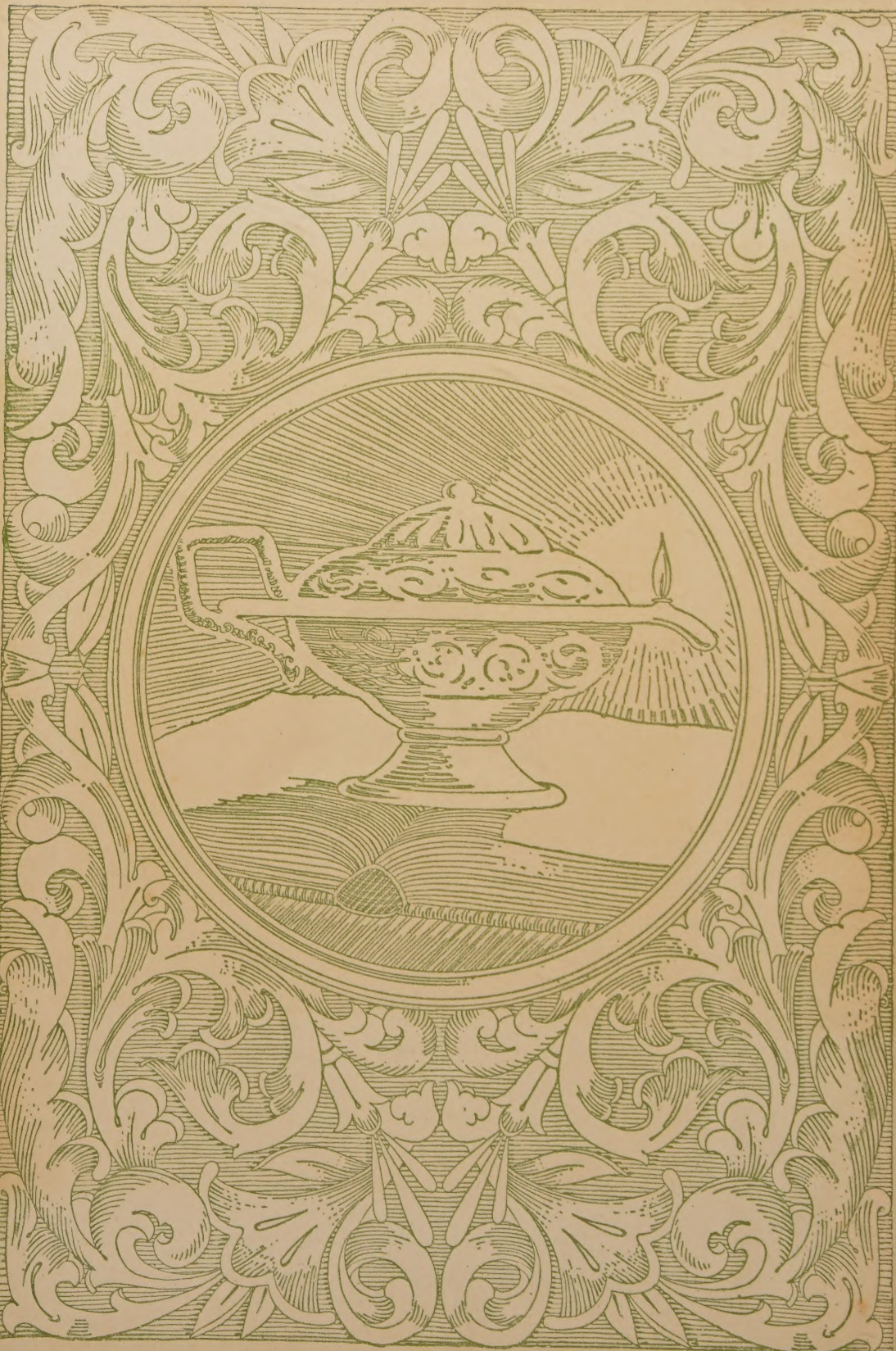

THE STANDARD REFERENCE WORK

FOR THE

HOME, SCHOOL, AND LIBRARY

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Jones, Alfred Gilpin (1824-1906), a Canadian statesman, was born at Weymouth, Nova Scotia, and educated at Yarmouth Academy. Entering politics in 1865, Jones identified himself with the Conservatives; he was hotly opposed to confederation, particularly as it would effect his native province. Because of denunciatory speeches made after the passage of the British North America Act, his loyalty was suspected by many of his political opponents. Nevertheless, he was elected to the Dominion Parliament for Halifax in 1867, and soon joined the Liberals. From 1874 to 1878 he was Minister of Munitions in the Alexander Mackenzie Cabinet; he served again in Parliament during 1887-91; and was lieutenant-governor of his home province from 1900 to 1906. During the latter part of his career, Jones was active in support of the plan for a trade alliance between the United States and Canada, and was consistently opposed to trade or political imperial consolidation.

Jones, Henry Arthur (1851-), an English playwright, was the son of a farmer. He was obliged to leave school when thirteen years of age and later obtained his education by his own efforts. At the age of twenty-eight his first play, *The Clerical Error,* brought him favorable attention. Mr. Jones has the gift for writing social plays which are usually comedies. His plays have become very popular in England and the United States. Among the most widely known plays are: *Saints and Sinners, Mrs. Dane's Defense, Whitewashing Julia, Hypocrites, Mary Goes First* and *The Lie.* He is also the author of *The Renascence of the English Drama.*

Jones, Jenkin Lloyd (1843-1918), an American Unitarian clergyman and writer, was born at Llandysil, Cardiganshire, Wales, and was taken to Wisconsin when an infant. He served in the Civil War, and graduated from Meadville, Pa., Theological Seminary in 1870. Dr. Jones' first pastorate was at Janesville, Wis., which position he held for 9 years, after which he came to Chicago and organized All Souls' Church. He was one of the leaders in the organization of the Congress of Religion and was editor of *Unity,* the organ of the congress. Dr. Jones was a leader in educational, philanthropic and all other enterprises for the betterment of the world. He was lecturer on literature at the University of Chicago and the author of several books, among which are: *Practical Piety, The Faith that Makes Faithful, Bits of Wayside Gospel* and *Conscience Calls.*

Jones, John Paul (1747-1792), a naturalized American sailor. He was born at Kirkbean, Scotland, the son of a gardener. At twelve he was a sailor lad on board a merchantman bound for Virginia, where he visited an elder brother, who was established as a planter. He was engaged for a time in the slave trade, but is said to have abandoned the business in disgust. In 1773 he again visited Virginia to settle up the affairs of his brother who had died. His original name was John Paul. About this time, being out of sympathy with his own family, he added the name of Jones.

At the outbreak of the American Revolution he offered his services to Congress, and was given the command of a ship. His masthead is said to have been the first that ever carried the stars and stripes. His ship carried to France the news of Burgoyne's surrender. He cruised along the French and British coast, capturing British merchantmen and taking them into French ports for sale. He sailed into the harbor of Whitehaven, England, captured the fort, and burned some of the ships lying at anchor. In 1779 the French government fitted him out a larger ship to which he gave the name Bonhomme Richard. He got together a small squadron of five ships, including his own, and was accompanied by two French privateers. With this naval force he cruised around Britain and Ireland, capturing no less than twenty-six merchantmen. September 23d he fell in with a fleet of British ships under convoy of the warship Serapis. Jones brought his ship into close quarters, lashed the Bonhomme to the Serapis, and succeeded finally in capturing the British vessel. Jones' ship went to the bottom, but he succeeded in reaching port with the Serapis. This naval action was fought gallantly on both sides, and was regarded a remarkable victory for the American commander. On

his appearance in France he was toasted, feasted, and made much of.

At the close of the war Congress passed a resolution complimenting Paul Jones on his naval skill and courage and voting him a gold medal. He became dissatisfied, however, with the command which Congress proposed to give him, and went to Paris to live. He was for a short time in the service of the Russians. He died in poverty in Paris. The place of his burial was for a long time unknown. In 1899 an investigation was begun. Records were finally discovered showing that he was buried in a small cemetery set apart for foreign Protestants. The cemetery was abandoned the year after his burial and is now covered with small buildings. General Horace Porter, the American ambassador, kept up a persistent tunneling, until, in 1905, a lead coffin was found bearing a plate marked with Jones' name. As a scientific fact, it is worth stating that the remains had been placed in alcohol in 1792, and that they were still in a reasonable state of preservation. The body was sent home on an American warship and reinterred in the naval ground at Annapolis, where a statue has been proposed in his honor.

Paul Jones appears to have been a man of peculiar temper, but that he was an able commander and a courageous fighter there is no doubt. He is held in high respect in naval circles as the founder of the American navy—the earliest of American fighters at sea, and a source of inspiration to both officers and men.

Jonson, Ben (1573-1637), an eminent English dramatist. His father was a London clergyman who died shortly before the birth of his son. His stepfather called him home from Cambridge to set him at laying brick. He ran away and enlisted in the army. At nineteen he returned from the Netherlands, a roistering blade with holes in his pockets and an unlimited capacity for drink. His biographers represent him as a big, coarsely framed portly, athletic fellow with a square jaw, thick lips, and an ungainly walk—rather the portrait of a prize-fighter. He turned to the stage for a living. His life is full of quarreling, dueling, imprisonment, want and disease, failures and successes. Were it not for the fame of Shakespeare, whom he challenged to many a combat of wit, Ben Jonson would be a central figure in dramatic literature.

Of his plays *The Alchemist* is read most frequently. Its nature is indicated by the title. The plot turns on the medieval superstition that lead could be turned into silver. The characters are sharpers and dupes. On the other hand *The Silent Woman* is in all respects the opposite of what the title implies. Wealthy old Morose, who desires quiet—absolute silence—in his house, supposes himself to be wedded to a dumb woman who suddenly becomes gifted with an admirable ability to speak, and fills his house on the wedding morn with a pandemonium of friends and strolling players come to the wedding feast. Morose is glad to buy peace and quiet at a price, which agreed to, his new wife admits that she is a youth in merry disguise. *Every Man in His Own Humour* is a braggart play proposing that twenty superlative swordsmen like the principal character, easily seen to be the author, go out in lieu of a regular army to challenge the enemy, squad by squad, to single combat till 40,000 are slain.

Jonson's reputation for ability was deservedly high. His popularity lay in the fact that he had the courage to stand against court society. We cannot admire his taste nor commend his judgment in all matters, but the populace is always ready to cheer on courageous opposition. As is usually the case the democracy allowed its hero to die not simply in want, but in the poverty of a hovel. His remains were placed in the Poet's Corner of Westminster Abbey. A stonecutter was employed, it is said, at a cost of eighteen pence to carve on the slab over England's second dramatist the words:

"O RARE BEN JONSON."

SAYINGS.

Hang sorrow! care 'll kill a cat.

The old bald cheater, Time.

He was not of an age, but for all time.

For a good poet 's made as well as born.

That world knows only two.—that's Rome and I.

Underneath this stone doth lie
As much beauty as could die;
Which in life did harbour give
To more virtue than doth live.

For a man to write well, there are required three necessaries: to read the best authors; observe the best speakers; and much exercise of his own style.

SAID OF JONSON.

He did a little too much Romanize our tongue. —John Dryden.

Jonson possessed all the learning that was wanting to Shakespeare, and wanted all the genius which the other possessed.—David Hume.

Many were the wit-combats betwixt him (Shakespeare) and Ben Jonson; which two I behold like a Spanish great galleon and an English man-of-war; Master Jonson, like the former, was built far higher in learning; solid, but slow in his performances. Shakespeare, with the English man-of-war, lesser in bulk but lighter in sailing, could turn with all tides, tack about, and take advantage of all winds by the quickness of his wit and invention.—Thomas Fuller, 1662.

The most obvious qualities of his intellectual nature are weight and force; of his spiritual nature; earnestness and courage. In the classics, accurate and thorough; and on every subject, athirst. He is said to have carried books in his pocket while working at his trade, in order, during leisure moments, to refresh his memory upon favorite passages in the Latin and Greek poets. In method he was careful and precise.—Welsh.

Joplin, a mining city in Missouri. It is the center of the great zinc and lead industries of the Ozark region. Ore is mined in vast quantities, and is then either distributed by the six railroads which enter the city or taken to one or another of its many manufactories. These include foundries and machine shops, paint and white lead works, smelters, flour and lumber mills. Joplin has also a large traffic in agricultural products and lumber. Some of the more notable structures are the opera house, the courthouse, the Y. M. C. A. building, a large federal building and a Carnegie library. The city owns the lighting plant. Joplin has come to be an important trade center and distributing point, as well as an attractive residence city. It is also the center of an up-to-date interurban electric line. In 1920 Joplin had a population of 29,902.

Jordan, the chief river of Palestine. It rises on the slopes of Mount Hermon and flows southward into the Dead Sea. Its length is about half that of the Thames. The lower part of its course is below the level of the sea. Its total descent is 2,300 feet. The Lake of Galilee is simply a widening in the upper course. The river is subject to floods in the winter season, but in the dry season it is not above three feet deep at its mouth. It is crossed by several fords and ferries. The Jordan is celebrated in sacred history. See GALILEE; DEAD SEA.

Jordan, David Starr (1851-), an American naturalist and college president. He was born at Gainesville, New York, and educated at Cornell University. The famous "barn class" of Louis Agassiz numbered him among its members. He has been successively professor of botany and biology in Lombard University, Illinois, assistant to the United States Fish Commission, professor of biology of Butler University, 1875-9, professor of zoölogy at the University of Indiana, and president of that university 1885-91. During this time he was pursuing investigations for the Fish Commission, the results of which have made him one of the leading authorities in the world on ichthyology. In 1891 he became the first president of Leland Stanford, Jr., University. He has had a large part in shaping the ideals and aims of that institution, which naturally lays special emphasis on the scientific side of an education. Besides being a scholar of high standing, Dr. Jordan is a very likable man. It pleases him to be able to say that during the first five years of the university he knew every student and faculty member personally. Dr. Jordan has written a number of books, among which may be mentioned *A Manual of Vertebrate Animals of the Northern United States, Science Sketches, Fishes of North and Middle America, Matka and Kotik, Care and Culture of Men, The Innumerable Company, Food and Game Fishes of North America, The Stability of Truth, Democracy and World Relations* and *The Human Harvest.*

Joseph, in Old Testament narrative, the eleventh son of Jacob. His mother was Rachel, Jacob's favorite wife. In the story of this motherless boy, who dreamed strange dreams, was so especially beloved by his father and so hated by his older brothers, there is something that fires the

imagination of every child. The pretty "coat of many colors" seems to arouse the jealous brothers to desperation, "so that they could not speak peaceably unto him," and when opportunity offers they strip the coat from him, and cast him into a pit. Some merchantmen coming by they decide against leaving him to die, and sell him into slavery. It seems fitting, then, to the true story lover, that Joseph should rise into power in Egypt, with his wonderful gift of explaining the dreams of the butler and the baker, and later of Pharaoh himself. His brothers come to purchase corn, and are recognized although they do not know Joseph. Then they find "every man his money in the sack's mouth" and are troubled and afraid. But hunger drives them and they go again to Egypt, this time taking Benjamin, the "little one" with them. They dine with Joseph, and tell him of the aged father left at home. And Joseph must needs leave them, that he may weep alone, although he is not yet ready to disclose himself. Then follows the finding of the silver cup in Benjamin's sack, the accusation of theft, the demand that Benjamin be left in Egypt, Judah's supplication to be kept instead of the lad, at last the disclosure, and the sending for Jacob, the happy reunion, and the reconciliation of Joseph with his repentant brothers. The last words of the book of Genesis tell us that Joseph died in the land of Egypt, that his body was embalmed, and placed in a coffin.

Josephine, Marie Rose (1763-1814) empress of France. She was the daughter of a French artilleryman and was born on the Island of Martinique in 1763. She was educated in a convent in the arts of singing, dancing, and making embroidery. An aunt resident in France brought about a marriage with the second son of the Marquis of Beauharnais, to whose family she was described as possessing "a fine complexion, beautiful arms and eyes, a sweet voice, and a remarkable taste for music,—altogether well advanced and formed for her age." Her father brought her to Havre and the marriage took place. Josephine and her husband were not particularly happy together. They had two children—a son and a daughter. Beauharnais sat in the constituent assembly. He was among the number executed by order of the Convention in 1790. Josephine paid Napoleon a visit to thank him for sending her son his father's sword. Napoleon was touched by her helpless beauty and later sought her as a wife. They were married March 9, 1796. She accompanied him during his campaigns in Italy, where she became the center of attraction. When Napoleon returned to Paris Josephine was his confidante—the one person who never lost faith in him. Her receptions were thronged by brilliant people and did much to reconcile Paris to Napoleon's ambitious views. When Napoleon was crowned emperor at Notre Dame, Josephine knelt by his side. But they had no children. Napoleon was anxious to found a line of kings. He resolved to divorce Josephine. This he did, in 1809, with much show of devotion. She returned to her country seat of Malmaison on a pension of $200,000 a year, devoting the rest of her years to a study of botany and other branches of natural history. She died in 1814, a well wisher of Napoleon to the end. Napoleon's star of empire set when he put Josephine away. Misfortunes seemed to dog his steps ever after. See NAPOLEON.

Josephus, Flavius (37?-95?) a Hebrew historian. He was born at Jerusalem. He belonged on both sides to priestly families. He was educated a Pharisee. At the age of twenty-four he made a trip to Rome to secure the pardon of some priests, friends of his, who had been sent thither on trifling charges. He was successful, not only in the main object of his mission, but in making friends at court who stood him in good stead later. When the Jewish rebellion, which brought on the destruction of Jerusalem and the banishment of the Jews by Titus, broke out, Josephus, if we may believe his own account, first opposed the Jewish movement, then accepted the command of the Hebrew forces in the army of Galilee. After the conquest he was well received by the Roman commander, Vespasian, and accompanied him to Rome. When Vespasian became emperor, Josephus was received with no little favor. He was assigned a royal residence and a pension, to which was sub-

sequently added an estate in Judea. His chief historical work is a *History of Jerusalem* in seven volumes, an account of the Jewish rebellion and the destruction of Jerusalem by the Romans. It appears to be trustworthy. Aside from certain exaggerations, easily detected, it seems to be a faithful picture drawn by an eyewitness. Another work, *The Antiquities of the Jews*, is little more than a paraphrase of the Old Testament narrative drawn up for popular reading. He wrote chiefly in the Greek language, but died at Rome. See JEWS.

Josh Billings, See SHAW, HENRY W.

Joshua, in Old Testament history, the leader of the Israelites after the death of Moses. He was the son of Nun of the tribe of Ephraim, and thus a direct descendant of Joseph. He was chosen by Moses himself as his successor. Moses died in the land of Moab, separated from the land of Canaan by the River Jordan. Over this river Joshua led the people into the promised land, the waters dividing miraculously, as "the feet of the priests that bore the ark were dipped in the brim of the water." Seven years were spent in dispossessing the heathen who inhabited the country. Many great cities were captured, the walls of Jericho fell flat before the trumpets of the priests and the shouts of the marching people. Over Gideon the sun stood still "in the midst of heaven" at Joshua's command, and "hasted not to go down about a whole day," until the Israelites should avenge themselves upon their enemies. Nearly the whole of Palestine was conquered and apportioned among eleven tribes, the twelfth tribe, the Levites, receiving no apportionment as they were to be the priests; "the God of Israel is their inheritance." Joshua lived to the age of one hundred ten, and was buried in Mount Ephraim. The story of Joshua's leadership and of his conquests is told in that book of the Old Testament which bears his name. This book so resembles the books of the Pentateuch that it is sometimes classed with them, the six books receiving the name of Hexateuch. In the last part of the book Joshua's farewell address to the assembled people is given. He reviews their history briefly, and exhorts them to remain loyal to the God of their fathers.

Josiah, the man who became King of Judah upon the death of his father, Amon, 641 B. C. He put down idolatry, established virtuous magistrates, and repaired the temple. He instituted a search for the lost book of the law, which had been missing for many years. It was found by Hilkiah, and read to Josiah, who thereupon began another assault against idolatry. In 616 B. C. Josiah marched against the Egyptians, and met his death in a battle fought at Megiddo. (2 Kings xxiii. 29-30.)

Jötunheim, yē'tŭn-hīm, or Utgard, in Scandinavian mythology, the home of the giants. It was supposed to be situated to the far north.

Joule, jool, **James** (1818-1889), an English physicist. He was a native of Lancashire. His father was a brewer. He was in part a self educated man, but came under the influence of the celebrated Dalton. His life work was a long series of experiments on the relations that exist between heat and energy. One of his experiments is easily understood. He attached a weight to a cord wound on an axle, and connected the axle with a series of paddles turning in a quantity of water contained in a reservoir, like a churn. As the weight descended, the paddles worked in the water. He found that the descent of the weight and the churning of the water heated the water. After making due allowance for loss of energy by friction and loss of heat by condensation, he decided that the descent of 772.55 pounds one foot, or one-tenth that weight ten times as far, etc., would raise the temperature of a pound of water 1°F. In other words, he established the doctrine, known as Joule's Law, that 772.55 units of mechanical energy are equivalent to 1 unit of heat. The converse of this statement is applicable to the operation of steam engines. Joule received honors and memberships in the leading scientific societies of the world, and in 1873 was made president of the British Association for the Advancement of Science.

Journalism, the profession of editing or writing for newspapers and periodicals. The making of a great city newspaper demands an editor-in-chief, a city editor with

a staff of reporters, a foreign editor, a financial editor, an agricultural editor, special correspondents, and if there are special departments an editor in charge of each. These persons are all journalists. The average periodical requires also a number of editors and journalists who conduct its various departments or write regularly on such subjects as the management wishes to present to the public. A person who sends contributions to various papers and magazines but is employed regularly by none, is not classed as a journalist but as a contributor, by the periodical, and as a magazine writer by the public. One who would enter the profession of journalism begins as a reporter, rises, if he can, to the position of special correspondent, and from that point advances according to his abilities to whatever department he is best fitted to fill. In 1903 Joseph Pulitzer, of the New York World, founded the School of Journalism, a college of Columbia University, giving $1,000,000 at that time, with the promise of another $1,000,000 when the school should be in successful operation. This is the first institution of the kind in the world. Its object is to elevate the profession of journalism not only by the better preparation of those who adopt it, but by attracting to it "more and more men of the highest capacity and the loftiest ideals." Since that date departments of journalism have been opened in many colleges and universities, and the time has come when a young man or woman may select journalism as a profession without fear and without reproach.

Jove, jōv, another name for Jupiter. See JUPITER.

Juan Fernandez, hoo-än′ fĕr-nän′dĕth, a rocky island 350 miles off the coast of Chile. It is thirteen miles in length and four in width. The animals and plants are those of Chile and the mainland. The sandalwood, tree palm, and other trees form forests. Fur seals were at one time plentiful. Sea fowl are numerous. There are said to be but four land birds, a thrush, kingbird, and two hummingbirds. The island was discovered in 1563 by a Spanish pirate for whom it was named. In 1704 a Scotch sailor, who quarreled with his captain, was, at his own request, put ashore here, with bountiful supplies. He was taken aboard by a passing vessel in 1709. In 1868 a tablet was erected in his memory at a point on a high hill where, no doubt, he stood for many an hour scanning the sea in search of a passing sail. The tablet bears an inscription beginning, "In memory of Alexander Selkirk, mariner, native of Largo in the county of Fife, Scotland, who was on this island in complete solitude for four years and four months," etc. Selkirk's adventures form the basis for Defoe's incomparable boy's hero, *Robinson Crusoe,* although the author appears to have drawn on other sources for a part of his material. See DEFOE.

Juarez, (hoo-ä-rācé) **Benito Pablo** (1806-1872), president of Mexico, and a full-blooded Indian. He received his education from a charitable friar and took up the profession of law. In 1832 he sat in the Mexican legislature. He was banished in 1853 by Santa Anna. After the latter's defeat he returned to Mexico and became minister of justice. In 1861 he was duly elected president of Mexico. The invasion and execution of Maximilian took place during his administration. During our Civil War his sympathies were with the Federals. His administration was rather stormy throughout. He was reëlected in 1871 and died of apoplexy in the city of Mexico in the following year. His reputation is that of a man of integrity and ability. See MAXIMILIAN.

Jubilee, Year of, an institution of the ancient Hebrews. Every fiftieth year was a Sabbatical year. At the end of seven times seven years, the completion of the forty-ninth year, the trumpet of jubilee was sounded throughout the land. The fields were left untilled; all lands and houses, save in walled cities, were returned to their original owners, or, if not living, to their heirs. In other words, sale was not valid beyond the following year of jubilee. Thus the widow, who had been forced by poverty to part with her house, fell again into possession of her own. The orphan, no matter how hardly he may have been dealt with, came again into his father's property. Debts were forgiven, slaves were set free. Members of families long separated were thus united with great re-

joicing. It was a sort of national bankruptcy act, appliable to all classes and conditions of society. At the close of the year of jubilee, society took a fresh start.

Judge, in the strict sense of the word, a presiding officer in a court of justice whose commission names him as a judge. Loosely the term is applied to a justice of the peace, or even to a referee. A judge, meaning the presiding officer of a higher court of law, must give a decision in cases in which the question is one of law; in cases in which facts must be decided by a jury, the judge instructs the jurymen as to what law would apply to the case and tells them exactly upon what points they must decide. When the jury renders a verdict of "guilty," the judge usually decides upon and pronounces the sentence.

Federal judges are appointed by the president with the consent of the senate and hold office during good behavior. They may be removed only by impeachment. State judges are chosen according to the state constitutions, in most states, being elected for a definite term of years.

Judson, Adoniram (1782-1850), an American pioneer missionary, was born in Malden, Massachusetts, and educated at Brown University and Andover Theological Seminary. After his graduation from the Seminary, Mr. Judson with five other students desiring to engage in missionary work addressed a letter to the General Association of Massachusetts (Congregational). This led to the formation of the American Board of Foreign Missions.

On June 17, 1912, Mr. and Mrs. Judson arrived in Calcutta. The East Indian Government ordered them out of the country. In the meantime, Mr. Judson had changed from the Congregational to the Baptist faith, and this led to the formation of the American Baptist Missionary Union.

After leaving Calcutta Mr. and Mrs. Judson went to Madras, and from there to Rangoon where they began their work. They mastered the Burmese language and gained a few followers. Later, he moved to Ava, the capital, in order that he might act as an interpreter. On the outbreak of a war between Burma and the East India Company Mr. Judson was cast into prison where he suffered great hardship for a year and seven months. About a year after his release he founded a church in Maulmain, Burma. He returned to America in 1845, but went back to Rangoon in 1847. But in 1850 he was forced by ill health to leave, and died at sea four days out of Maulmain. While the work of Dr. Judson and his helpers did not result in a large number of converts during his lifetime, he laid the ground for future workers; and in compiling a Burmese-English and English-Burmese dictionary and a Burmese grammar, he greatly lightened the labor of his successors.

Judson, Harry Pratt (1849-1927), an American educator, president of the University of Chicago from 1907 to 1923, was born at Jamestown, New York, and educated at Williams College. Dr. Judson began his teaching career in 1870 in the high schools of Troy, New York, serving as instructor and principal until 1885. In the latter year he occupied the chair of history at the University of Minnesota. Later, in 1892, he became identified with the University of Chicago, serving as professor of political science, head of the political science department and dean of the faculties of arts, literature and science. Dr. Judson was acting president of the university during 1906-7, being raised to the presidency in the latter year. He has written numerous historical and other works, among which are *Caesar's Army, Europe in the Nineteenth Century, The Growth of the American Nation, The Young American, The Essentials of a Written Constitution* and *The Higher Education as a Training for Business.*

Juggernaut, jug'ger-nawt, a famous Hindu idol. The temple of Juggernaut is situated in a sacred town of that name some 300 miles along the coast southeast from Calcutta. The grounds are of large extent, inclosing 120 temples. Twenty-four festivals a year draw thousands of pilgrims whose gifts amount to incredible sums. Once a year Juggernaut, on a car forty-five feet high and thirty-five feet square, mounted on sixteen wheels, seven feet in diameter, is dragged to his summer house a mile distant. The sand is so deep and the devotees so poorly organized that

the ceremony occupies several days. Englishmen formerly supposed that the worship of Juggernaut required that a score or two of devotees cast themselves under the ponderous wheels of the car to propitiate the god's wrath, but this is probably an error. It may be seen readily that, with a frantic, howling mob pushing and dragging the equivalent of a three-story house through deep sand, enough poor wretches would accidentally get under the wheels or be trampled to death to secure the favor of any ordinary idol. The idea of a Juggernaut rolling on mercilessly over the bodies of its self-devoted victims has become fixed in our language, however, and is applied to any burdensome custom or institution requiring sacrifice. See INDIA.

Jugoslavia, or **Yugoslavia,** is one of the new states of Europe created after the close of the World War. The term means "Southern Slav State," and the country includes Serbians, Croatians and Slavonians, part of whom had been subject to Austria-Hungary and the remainder to Serbia. When the collapse of the Austro-Hungarian empire was no longer doubtful, these peoples declared their independence and began to work for the union that was effected in 1918.

This state lies to the north of Greece and Albania, and has an area about equal to the combined areas of England and Scotland. The formation of Jugoslavia was favored by the United States, Italy, France and England, and upon its erection, the former king of Serbia, Alexander I, was made ruler. The constitution, adopted June 28, 1921, provides for a single chamber of 419 representatives elected for four years on the basis of one for each 40,000 inhabitants.

INDUSTRY AND COMMERCE. Jugoslavia is largely agricultural, having a fertile soil that produces in abundance the cereals, fruits and vegetables native to the temperate zone. Almost every peasant cultivates his own freehold, which is usually a piece of land from ten to thirty acres in area. Silk culture is practiced by large numbers of the people. About half of the total area of Jugoslavia is forested; beech, oak and fir predominating.

The mineral resources of the country are considerable, and include coal, lignite, iron, copper, gold, lead, cement, silver and antimony, coal and copper being the most abundant. The production of these has steadily increased, under ever more efficient methods, since 1918.

Flour is the principal product of Jugoslavia's manufactories, there being more than 50 flour mills in the state. Weaving, especially of carpets, bootmaking, pottery making, tanning, brewing and distilling, iron working and meat packing are also important.

The trade of the country is chiefly with Austria and Italy. The most important imports are animal products, agricultural products, chemicals, metals and machinery; exports, corn, cattle, prunes and timber. Many of the roads in the state are in a very bad condition, but there are 1,697 miles of navigable rivers, and the railroads are kept in good condition.

RELIGION AND INSTRUCTION. The state religion is Serbian-Orthodox, but Roman Catholics almost equal the Orthodox numerically. There is, however, the greatest freedom of conscience.

Elementary education is free and compulsory, and is provided for by about 6,000 elementary schools with 13,000 teachers. The state maintains 35 training schools for elementary teachers. There are also numerous special and technical schools, a law school, a military academy and three universities—at Belgrade, Agram and Ljubliana.

GENERAL. Jugoslavia maintains a peacetime army of about 150,000, service being compulsory for men between twenty-one and forty-five. The country has a considerable debt, but the land is fertile and the inhabitants industrious, and the prospects for future prosperity are bright.

STATISTICS. The following are the latest statistics to be had from trustworthy sources:

Area, square miles	95,628
Forest area, acres	3,750,000
Population (1920)	11,406,628
Serbs) Croats) Slovenes)	9,546,000
Germans	508,494

Hungarians	494,163
Albanians	479,890
Chief Cities:	
Belgrade	120,000
Agram	80,000
Ljubliana	60,000
Sarajevo	50,000
Number of districts	6
Members of Constituent Assembly	419
National revenue	$190,000,000
Bonded indebtedness	$712,000,000
Farm area, acres	11,930,740
Wheat, bushels	48,800,000
Oats, bushels	25,600,000
Barley, bushels	15,200,000
Sugar, tons	38,500
Potatoes, bushels	7,000,000
Corn, bushels	10,000,000
Tobacco, tons	15,000
Domestic Animals:	
Horses and mules	1,458,326
Cattle	5,496,531
Sheep	9,771,985
Goats	2,447,949
Swine	4,849,457
Brown coal, tons annually	2,000,000
Iron ore, tons annually	165,000
Coal, tons annually	860,000
Imports	$715,000,000
Exports	$264,000,000
Miles of railway	5,684
Teachers in public schools	15,552
Pupils enrolled	856,504

Julian, or Flavius Claudius Julionus (331-363), Emperor of Rome from 361 to 363 who by trying to restore pagan worship won the surname of The Apostate. He was born at Constantinople, the son of Julius Constantius and nephew of Constantine the Great. Because of their youth, Julian and his brother Gallus were spared when Constantius II, son of Constantine, massacred the imperial family. Julian was immured in a lonely castle in Cappadocia, however, where he was subjected to constant espionage. The result was that he learned to detest Christianity. Allowed to remove to Athens, later, Julian diligently studied philosophy and laid a reasoned base for his disbelief in Christianity. The Emperor gave Julian the title of Caesar and sent him with an army against the Germans who were threatening Gaul. After defeating the enemy at Strassburg and compelling the Gauls also to make peace, Julian became very popular. When Constantius ordered Julian to go into the East with his army, the soldiers revolted and proclaimed Julian Emperor. He set out for Constantinople to oppose Constantius, but Constantius died and Julian entered Constantinople in triumph. He began at once to restore paganism in all its glory, but at the same time issued an edict of toleration towards the Christians. His efforts to reestablish the ancient worship were entirely fruitless. Julian composed in Greek a number of orations, letters, poems and satirical essays, some of which are still extant.

Juliet. See ROMEO AND JULIET.

July, the seventh month of the year. In the old Roman year which began with March it was the fifth month, and was called *Quintilis*. The name July was assigned by Julius Caesar when he reformed the calendar, this being the month of his birth. He gave it thirty-one days.

Jumbo, a large African elephant on exhibition for twenty-five years in the Royal Zoological Garden at London. Jumbo was sold to P. T. Barnum, 1882, for $10,000 and traveled with his circus for three years, but was killed finally in a railroad accident in Canada. He weighed about 12,000 pounds. His skeleton, preserved in the Smithsonian Museum at Washington, is eleven feet six inches in height. See BARNUM; ELEPHANT.

Jumna, or **Jamna,** a river in India, the largest tributary of the Upper Ganges, takes its rise in the Western Himalayas, at an altitude of 11,000 feet. It empties into the Ganges at Allahabad. It is about 860 miles long, its chief tributaries being the Chumbul, the Betwa and the Ken. During the hot season, the Jumna dwindles, due to the Eastern and Western Jumna canals, which are fed by its waters and are used by light craft and for irrigation purposes. Both canals join the Jumna at Delhi. Historically and politically, its upper portion is more important than the Ganges itself. It obstructed the way of the early invaders from the northwest. Hence, Agra and Delhi were built on its banks, these being the two capitals of India's Moslem conquerors.

Jumping Mouse, a North American rodent related, not very closely, to true mice. The entire family consists of a single species confined to North America

The body of the adult is about three inches long. The tail is five inches long. The hind legs are very long; the forelegs, short. The hind foot is over one-third as long as the body. The hips are large, the fore parts short. Hips, rear legs, feet, and tail are adapted for taking long leaps. In some ways the jumping mouse reminds the observer of the smallest species of kangaroo found in Australia, but the American animal is entirely without the pouches for the young. The fur is coarse, and is of an intense yellowish cast, with pencilings of brownish black, due to long hairs on the back. The under parts are white. The following account is from the pen of Mr. Slade in *Merriam's Mammals of the Adirondacks:*

> The long-tailed jumping mouse inhabits high land or low land, forest or pasture, cultivated field or swamp, and appears to be equally at home in either, and numerous in any situation. It possesses a momentary agility second to no other rodent, and a muscular strength of enormous power for so small a creature. When suddenly disturbed, it often moves away in a direct line, the first three or four leaps being eight or ten feet in length; but these distances rapidly decline to about four feet, which are continued until it considers itself out of danger. This is not always the case for it frequently takes an irregular course and jumps at diverse angles for several successive leaps. . . . It feeds upon the buds, leaves, and twigs of many kinds of plants, upon seeds, grain, wild berries, chestnuts, acorns, grass, and, to some extent, upon the bark of shrubs. . . . As a rule, three litters are produced in a season, each consisting of from two to four young.

Junco, a bird of the finch or sparrow family. The common junco is a slate-colored bird with light under parts and a light bill. It may be known by two white outside tail feathers displayed in flight. The junco breeds in the evergreen belt of Canada and the eastern United States. In winter these little "gray-robed monks and nuns" go southward as far as the heavy snows go. The junco is one of the most popular and well known of the snowbirds.

June, the sixth month of the year. The term is a Latin family name, meaning young. It has thirty days. The longest day of the northern summer and the longest night of the southern winter occur June 21st. In the north June is a month of flowers—"the month of roses." In the far south it may be a month of icicles. The name is applied to a number of plants and insects. Kentucky blue-grass is called June-grass because it heads in June. A clumsy brown beetle with a white grub is known as the June-bug. The shad bush or service-berry is called also the June-berrry June is a favorite month with the poets.

> And what is so rare as a day in June?
> Then, if ever, come perfect days;
> Then Heaven tries the earth if it be in tune,
> And over it softly her warm ear lays.
> —Lowell.

Juneau, Laurent Solomon (1793-1856), a pioneer of Wisconsin. He was born at L'Assumption parish near Montreal, Canada. From there he went to Green Bay, Wisconsin, and later in 1818 to the site of Milwaukee, where he secured the land of Mirandeau, the first white settler there. He made the first survey of the village, was its first postmaster, its first president, and upon its becoming a city, the first mayor. In Juneau park, Milwaukee, stands a fine statue in memory of this pioneer.

Juneau, jōō-nō′, the capital of Alaska since 1906. It is situated on Gastineau Channel, northwest of Sitka and southeast of Skagway. It is an up-to-date town in the center of a rich mining region, and has a large trade in miner's supplies. It exports gold and furs, and manufactures foundry products, malt liquors, cigars, and other articles. The famous Treadwell and Silverbow mines are in the neighborhood. Indian villages of the Auk and Taku tribes are of interest to tourists. The population is 1,300.

Jungfrau, yŏŏng′frow, one of the most impressive mountains of Switzerland. The name is German, meaning literally the young woman or maiden. It is the highest peak but one of the Bernese Alps,—13,571 feet. Seen from the road leading from Lauterbrunnen to Grindelwald it is a majestic pinnacle of rock wrapped in a dazzling shroud of eternal snow. In the summer season the region is one of absolute awe-inspiring stillness, save for the chatter and clatter of tourists and the echoing thunder of avalanches. In 1811 the Jungfrau was scaled for the first time by two guides. Since that date the ascent has been accomplished by Alexander Agassiz and other scientists. It is now managed regularly

under the direction of skilled guides. An inclined railway, 13,670 feet in length, climbs the mountain. A large part of the way is cut through tunnels, but these are open at frequent stations where passengers may alight to view the scenery. The very tip of the mountain, a distance of 242 feet, may be ascended by a lift and by a spiral stairway. See BLANC, MONT; SWITZERLAND.

Jungle-fowl, a popular name for several wild fowls of India and southeastern Asia. They are supposed to be the ancestors of our domestic fowls. See CHICKENS; MOUND-BIRDS.

Juniper, a genus of ornamental evergreen trees and shrubs. The junipers are closely related to the cypress and arbor vitae. They belong to the family of conifers, but, in place of a dry cone, the fruit is inclosed in a fleshy globe much like a berry. There are at least a score of junipers. The red cedar, with fragrant wood used for cabinets and lead pencils, is a juniper. The common juniper has dark blue fruit. It has a wonderful power of adapting itself to circumstances. In a protected locality with fair soil it becomes a tree forty feet high. On a rocky, windy bank, its branches lie on the ground and its crown may not attain a height of more than a foot or two. The junipers of the Pacific coast vary similarly in habit. See CONIFERS.

Junipéro, Miguel José Serra (1713-84), a missionary of the Franciscan order to the Indians of California. He was born on the island of Majorca, and when he became a priest exchanged his baptismal name for that of Junipéro. When 36 years old he sailed as a missionary to the Spanish colonies, and from 1750 to 1769 ministered to the nomadic tribes of aborigines in Mexico. When the Jesuits were expelled from Lower California, Junipéro took charge of their work. While he was president of the California missions the missions of San Diego San Carlos, San Antonio, San Gabriel, San Luis Obispo, San Francisco, San Juan Capistrano and Santa Clara were founded. His particular charge was the San Carlos mission at Monterey, and he was in charge of 16 monasteries of the Order of St. Francis, which by 1870 had converted some 3,000 Indians, giving them instruction in the arts of peace, and inducing them to cease their wanderings and take up agriculture around the missions. In their turn these required presidios for their protection, and thus the settlement of California was begun. Father Junipéro was buried in his own church yard at Monterey, and was succeeded by Father Palon.

Junius, jun'yus, **Letters of,** a famous series of political letters signed Junius. They were forty-four in number, and appeared in the *Public Advertiser,* of London. The first was published November 21, 1768. The last bore the date of January 21, 1772. The title of the first, *The State of the Nation,* indicates their general character. The author attacked several leading members of the ministry, denouncing them for inefficiency. He showed that he was intimately acquainted with their private lives and with the proceedings of Parliament. He had the gossip of court at his fingers' ends and lashed his enemies into a perfect fury of resentment. "Who wrote the letters of Junius?" was for decades a much argued question. The question has never been settled on circumstantial evidence. Macaulay handles the topic exhaustively, claiming that Sir Philip Francis, in point of handwriting, familiarity with government and social circles, and ability as a writer, answers the known conditions perfectly. As Francis received a lucrative appointment to a post in India at the time the correspondence ceased, it is probable that the government took this means of silencing a troublesome adversary.

Junk, a Chinese ship of clumsy construction. It is a sailing vessel of from one to five masts. It is often of large dimensions. It has a flat bottom, a high, square prow, and a high stern. The name is applied both to river crafts and to large seagoing vessels. In an item giving the arrivals at Hong-Kong as so many steamers, ships, and junks, the latter term is used to denote native crafts. The word is of Malay origin, and appears to have no connection with the odds and ends of old rope, chain, iron, copper, bottles, and other rubbish gathered up by junk dealers.

Juno. See HERA.

Junta, the name applied in Spain and and all the Spanish-American countries to a group of persons combined for political or civil purposes, called together by the ruler or meeting of their own accord as representatives of the people. The name, however, has frequently been used in other countries, notably England and the United States. In the reign of William III and Anne of England, the combination of the Whig leaders was commonly known as the Whig Junta. In the United States, Benjamin Franklin organized a debating society which he named "The Junta," and which later developed into the the American Philosophical Society.

Jupiter, in Roman mythology, the greatest of the gods. He corresponds to the Zeus of the Greeks. The different names given him indicate his character. As the heavenly father he had all power over the skies. Jupiter Pluvius was the rain giver; Jupiter Tonans, the thunderer; Jupiter Fulminator, the lightning-hurler, and Jupiter Serenator, the weather-clearer. As Jupiter Prodigialis he sent the children of men prodigies or signs of what was about to happen. Jupiter Imperator was a ruler; Jupiter Victor, the conqueror; Jupiter Stator, a supporter or stander-by. Jupiter was also Optimus Maximus, the best and greatest of the gods. The Romans erected temples in his honor. His principal temple was on the Capitoline Hill, whence he was called Jupiter Capitolinus. In this temple his statue was associated with Fides and Victoria. When war and other important measures were under consideration lots were cast and the prodigies were observed, as perchance Jupiter might grant some intimation of what it were wise to do. When about to go into battle, the consuls offered sacrifices to Jupiter, praying that he might lead them against the enemy, and, on their return from victory, thanksgivings were offered in his name. Jupiter was the divinity of the heavens, the sky; hence, white, the color of the day, was sacred color. His priests were clad in white, white animals were offered on his altar, and white horses drew his chariot. The genuinely Roman conception of Jupiter appears to have assigned him attributes of dignity, truthfulness, and fatherly love for his people. Jupiter was also the god of suppliants.

Jupiter, the largest planet of the solar system, is fifth in order from the sun, around which it revolves once in twelve of our years. The diameter of Jupiter is 88,000 miles, approximately eleven times that of the earth; its surface area is 122 times and its volume 1,355 times that of the earth. This planet, though so large, is not nearly as dense as the earth. It is believed that Jupiter is in a gaseous state very similar to the sun, though it does not give off as much light as the latter. Yet, after Venus, it is the brightest star.

Jupiter turns on its axis once in slightly less than ten hours. Its axis is only slightly inclined to the plane of its orbit, thus indicating that there is but little change of season. Viewed through the telescope, Jupiter is seen to be crossed by numerous brightly colored bands that parallel the equator. Its outline is vague, indicating a comparatively dense atmosphere.

SATELLITES. Galileo, with his telescope, discovered four satellites of Jupiter, the first important observation he made. A fifth satellite was discovered by Professor E. E. Barnard of Lick Observatory; a sixth and seventh were discovered by C. D. Perrine, also of Lick; an eighth was then discovered; and finally a ninth, the latter also by a worker at Lick Observatory, S. B. Nicholson. Curiously, the last two satellites discovered, the eighth and ninth, are seen to be moving in the opposite direction to the others, a phenomenon that has caused much speculation among astronomers. See PLANETS; LICK OBSERVATORY; ASTRONOMY.

Jura, an important mountain range of Europe, extending from northeast to southwest and forming the boundary between France and Switzerland, and finally passing into the latter country. It forms a plateau between the Rhine and the Rhone rivers about 155 miles long, 40 miles wide and from 2,000 to 2,500 feet high. The German Jura begins at the Rhine; the range, south of the Rhone, is known as the Jura Alps, and finally merges with the Swiss Alps. The eastern face of the range is greatly diversified by peaks and gorges, and several beautiful lakes lie

among the lower elevations, Lake Geneva being the largest. The highest peaks are the Reculet, 5,643 feet, Cret de la Neige, 5,653 feet, Mount Tendre, 5,512 feet, and Dole, 5,507 feet. The two largest rivers that rise from the range, both of them French streams, are the Ain and the Doubs.

The range is composed chiefly of limestone, and gives its name to the Jurassic or second geological system, considered chronologically. The range is markedly deficient in minerals, though small amounts of salt, copper and iron are found. The timber is valuable, however, and limestone, granite and alabaster are extensively quarried.

Jurassic Period, the name given by geologists to the system of strata following immediately after the Triassic and preceding the Cretaceous. The name derives from the Jura Mountains (which see), a range abounding in the limestone formation that characterizes this period. Jurassic formations are found in Alaska, Oregon and California in North America. Jurassic rocks abound in fossils, especially in Europe, where thousands of specimens have been found. At the close of the Jurassic period there occurred great upheavals in what is now the western United States, when the formation of the Klamath and Sierra ranges was begun.

Jury, a body of men selected by a court to pass on certain facts. There are three kinds of juries in the United States. A coroner's jury, usually of six men, may be impaneled by a coroner to inquire into the circumstances of a death and determine whether it was due to natural causes, or whether it requires further investigation. A grand jury is called upon to sift accusations that may be made against an alleged criminal. If, in the judgment of this jury, the accused should be required to stand trial, an indictment is brought. A petit jury has more serious work in hand. Its decisions are practically final. In case of an accusation of murder, for instance, the petit jury of twelve men is called upon to hear the evidence and to decide whether the accused is guilty beyond all reasonable doubt. The presiding judge is expected to excuse from the jury all who, upon examination, appear to have a prejudice against the accused, and all who are biased against the execution of the laws as they stand. The counsel for the defendant is also permitted to excuse a certain number peremptorily, without giving any reason other than that he deems them unfit to try the case. In case the jury disagrees the status of the accused is the same as it was before trial. He may be tried again. In case the jury acquits, the accused cannot be placed in jeopardy again for the same offense.

Save in the army and navy, and during the reign of martial law, the right of trial by jury of their peers is secured to all in English-speaking countries. This right is incorporated in the constitution of the United States, it being considered that one's neighbors are more likely to do him justice than a bench of judges or other officials. In view of the fact that many who are clearly guilty go free by reason of sympathy, some students of law assert that the ends of justice would be more likely to be secured if the petit jury were replaced by a bench of judges or professional triers of cases.

The origin of the jury has been sought in the old English custom of compurgation described elsewhere. Historians of the law state, however, that compurgation had been forgotten for a few centuries before trial by jury became a practice. Richard Green, the eminent historian, fell into the common error of locating a date and an event for the origin of the jury. According to him, we may trace the origin of the petit jury to the Assize of Clarendon in 1166. In the trial of certain criminal cases twelve lawful men were summoned to assist the judge. They were to act not only as witnesses but as jurors. They were called upon to give the general reputation and standing of the alleged criminal in the community, and to render an opinion as to whether he was guilty of the particular charge preferred. As a matter of fact, the jury, as known in English-speaking countries—"the bulwark of English liberty"—is a descendant of the Frankish and Norman use of the inquisition or search into the facts. The Norman courts introduced into England the practice of summoning by public authority a number of men who lived in the locality and might be relied

upon to know the truth and tell the truth as to the facts in question. These jurors, so called because they were placed under oath, were at first witnesses. The official courts, we may call them, of William the Conqueror, that compiled the Doomsday Book, summoned juries of this nature. The nature of the jury changed gradually. At first the jury gave evidence as to the guilt of the defendant charged with crime, or relative to the rights of adverse claimants to land.

It appears to have been recognized at an early day that twelve men, good and true, even though they had no personal knowledge, or entire knowledge, might be depended upon to come at the facts of the case if assisted by testimony. In the later development of the system, the jurors were chosen, not to give evidence, but to sift evidence, and that is the present function of the jury. In fact, the juror takes oath that he has not formed prior opinion and that his mind is open. The court decides what witnesses may appear before the jury and what evidence may be admitted. The judge in his charge limits the inquiry of the jury to a narrow field. The verdict of the jury is reduced practically to a decision of whether the testimony is to be credited or not. The law and the court leave the jury little else to do. In civil cases, as suits for damage or recovery, it devolves upon the jury to award a fixed sum.

The spread of the petit jury from England to other English-speaking lands was general. In criminal cases the early Scotch jury consisted of fifteen persons. A majority of this jury might render a verdict. The verdict might be "guilty," or "not guilty," or "not proven." The last named, known as a Scotch verdict, released the accused, but affixed a brand of implied guilt. The juries of continental Europe are considered an outgrowth of Roman law and procedure.

Jussieu, zhü-se-uh′, **Laurent de** (1748-1836), a noted French botanist. Jussieu's father was a professor of botany in the Royal Garden. His uncle was a superintendent of grounds at Versailles. Both took pride in Laurent, and helped him to a knowledge of plant classification. His *Genera Plantarum,* a classification of plants accepted by modern botanists, was published in 1775-89. Jussieu was rewarded by a professorship in the Garden of Plants, Paris. His work in classification was carried on by De Candolle, who worked out details and made improvements. It seems natural to divide plants into flowering and flowerless; and to divide flowering plants into those with two seed leaves and those with one seed leaf; and then to divide those with two seed leaves into plants with seed pods and those with naked seeds; those with seed pods into plants with many-petaled, one-petaled, and no-petaled flowers, and so on to the family, genus, and species; but there was a day when no such suggestion had been made and botanists were quite at sea. See LINNAEUS.

Justinian I (483-565), emperor of the East. He was surnamed "the Great," His parents were Gothic peasants. His wife was an actress named Theodora. He made himself emperor in 527. He did much to restore the dignity of the empire. He was fortunate enough to have two great generals, Belisarius, who defeated the Persians and the Africans, and Narses, who put down the Ostrogoths in Italy. In 532 a fight broke out in the great hippodrome between two factions known as the Green and the Blue. The contest spread to the city and was not ended until Belisarius, taking the side of the Blues, put to death 30,000 Greens. A large part of the city, including the church of St. Sophia, afterward rebuilt, was destroyed. The reign of Justinian is remembered chiefly, however, for the publication of the Justinian Code, a codification of Roman law. It was drawn up by ten men learned in legal matters. It is considered the greatest codification ever made. It is the basis of modern law. See CODE.

Jute, jūt, the fiber of a tall herb of India. The jute plant looks like hemp, but, though an herb, it is a member of the basswood family. Its bark yields a fiber, comparable to the inner bark of the basswood, often twelve feet in length, from which gunnysacks are made. Jute makes a strong rope, subject, however, to rapid decay. A heavy gunnysack trodden underfoot rots much sooner than a light cotton sack. The United States imports immense quantities

of jute for sacking. India raises 2,250,000 acres of jute. India sells more jute than rice, the export of jute being second to that of cotton only. The plant seems to do well in the Gulf States, but we lack the cheap labor and facilities of India and can import our gunnysacks more cheaply than we can make them. Jute is used also in the manufacture of carpets. Genuine Afghan curtains, Smyrna rugs, and the tapestries of Teheran and Herat are made of the finer qualities of this material. The inner bark may be divided into a fiber so fine and flossy that it is used in a mixture with silk. Dundee, Scotland, is noted for jute weaving. See FLAX; HEMP; RAMIE; SISAL; ESPARTO.

Jutes, a low German tribe that invaded Great Britain in the fifth century in company with the Saxons and Angles. It was supposed, as a matter of course, that they came from the peninsula of Jutland, now Denmark; but historical evidence goes to the contrary. At all events, they established themselves in Kent, Hampshire, and the Isle of Wight, and founded the kingdom of Kent.

Jutland. See DENMARK.

Juvenal (47-138 A. D.), a Roman satirist. Juvenal is highly valued for his word painting of life in Rome. We cannot do better perhaps than make room for Macaail's description of the third satire: "It s in the third satire that his peculiar gift of vivid painting finds its best and easiest scope. In this elaborate indictment of the ife of the capital, put into the mouth of a man who is leaving it for a little sleepy provincial town, he draws a picture of the Rome he knew, its social life and its physical features, its everyday sights and sounds, hat brings it before us more clearly and harply than even the Rome of Horace or Cicero. The drip of the water from the queduct that passed over the gate from vhich the dusty, squalid Appian Way tretched through its long suburb; the garet under the tiles where, just as now, the igeons sleeked themselves in the sun and he rain drummed on the roof; the narrow rowded streets, half choked with the builders' carts, ankle-deep in mud, and the pavement ringing under the heavy military boots of guardsmen; the tavern waiters trotting along with a pyramid of hot dishes on their heads; the flower pots falling from high window ledges; night, with the shuttered shops, the silence broken by some sudden street brawl, the darkness shaken by a flare of torches as some great man, wrapped in his scarlet cloak, passes along from a dinner party with his long train of clients and slaves: these scenes live for us in Juvenal, and are perhaps the picture of ancient Rome that is most abidingly impressed on our memory." Of his works sixteen satires survive. See SALLUST.

Juvenile Court, as the name implies, a court for the trial of cases against juvenile lawbreakers. Though the tendency is always toward giving to some one person, city or state the honor of having begun something new, yet it is impossible to designate any person as the initiator of the Juvenile Court, or to assign a definite place of origin for it. Like all other established courts and modes of legal procedure, the Juvenile Court is the fruit of long growth, and of the demands of logic that youthful offenders, male or female, be separated for hearing and, if convicted, for confinement, from hardened habitual, adult criminals, contact with whom cannot but influence the child harmfully. Jurists, prison reformers, philanthropists and others gave serious thought to the case of the juvenile delinquent long prior to the establishment of courts and institutions for dealing with this kind of wrongdoer; and thought and discussion on this question, in Europe and America, gradually led to the adoption of a wholesome attitude toward the child against whom charges were brought.

Among the first items of statutory law to be brought to bear on the subject of juvenile delinquency, the two most important were, first, probation; second, the law that forbade the placing of children in confinement with adults. The probation item is really the foundation upon which the entire Juvenile Court edifice rests. It was first used, as far as research will divulge, in Massachusetts in 1869, when it was required for the governor that he appoint what was known as a "visiting agent", whose duties were those of a pro-

bation officer, to work for the children's salvation to society instead of for punishment. He was required to attend hearings and aid the accused in every way possible. Hardly less needful was the separation during confinement of children and adults. The prison conditions that forced the passage of this law were such that young boys and girls, as lately as the first half of the nineteenth century, and in many places even later, were subjected to horrible acts of brutality and depravity at the hands of adult criminals.

Following these items, the two next in importance were the law that gave the child a separate trial from adults, and the law that gave a child under sixteen the right to a hearing in what is known technically as a chancery, as distinguished from a common law court. It was recognized by all who seriously considered the matter that the juvenile offender might be —often was—the victim of circumstances over which he had no control, and that his offense might be the result of a condition for which he could not be held accountable. Under this changed attitude, therefore, the young offender was considered unfortunate rather than naturally depraved and somewhat precocious, and it was conceived as the duty of the state not to punish, but to help and protect.

In the United States, progress in the establishment of Juvenile Courts was quite rapid after 1890. But it was not until comparatively recently that Juvenile Courts, separate in name, place and function from any other court, were established. In 1899 the Juvenile Court Act of Illinois was passed, providing, in part, that the Circuit Court, already established, could be termed the Juvenile Court. Thus the act did not provide for a separate court and did not provide for a very important proceeding of later origin, namely, that the same judge who tried children could try adults for contributory delinquency or for major offences against children. The overwhelming importance of a contributory delinquency law was not recognized until later.

Also in 1899 an act was passed in Colorado that authorized county courts, acting as courts of chancery, to proceed against and correct any child between the ages of eight and sixteen. Both the Illinois and the Colorado acts were as all such acts are at their inception—crude and tentative. Yet the Colorado act was made the basis of the elaborate and, no doubt, the most humane and efficient Juvenile Court in the world—that of the city of Denver. The Juvenile Court acts of the greater part of the states that have such acts are modeled upon the Illinois and Colorado acts; as are those of England, France, Germany, Japan, Scandinavia and numerous other countries that have made provision for these courts.

The range of the influence of American Juvenile Courts has been extended until it includes investigation of the home conditions of delinquent children; the establishment of separate and wholesome institutions for the incarceration of children, when that is necessary; and the probationing of children and healthy direction of their activities when at all possible. Juvenile Courts are so conducted that no stigma attaches to the child because his conduct has been investigated; he is always given the benefit of doubt; and the result has been the fashioning of proper citizens from material easily productive of evil. See LINDSEY, BENJAMIN BARR.

K

Kabul, an ancient and important city, the capital of Afghanistan and of the province of Kabul, is on the Kabul River at the point where it ceases to be fordable, 300 miles northeast of Kandahar. It is 6,900 feet above sea level, but is itself dominated by the peaks of the Hindu Kush, about 14,000 feet higher. The city is generally poorly paved and lighted, though some quarters are fairly modern. It is criss-crossed by subdividing walls penetrated by narrow gates. It contains an arsenal, electric-light plant, machine shops and carpet weaving plants, and has a large trade in agricultural produce, especially grapes and melons. The one newspaper in Afghanistan is published here; it is called the *Court Gazette*. Kabul has been witness to numerous events important in British history. It was taken by British troops in 1839 and in 1879; and from here Lord Roberts started on his march to Kandahar. See AFGHANISTAN.

Kadiak, or Kodiak, is the largest of the Alaskan group of Islands, known as the Kadiak Islands. The group is situated to the south of Cook Inlet, and is separated from the Alaska Peninsula by Shelikof Strait. The area of Kadiak is 36,000 square miles; the island is wooded, the timber being valuable; it has several good harbors; and the salmon fisheries are of the first importance. Cattle raising, introduced on the island by the United States Department of Agriculture, has proven quite successful. The Kadiak bear, the largest in the world, is found only on this island. The largest town, Karluk, has a population of only 550. See ALASKA.

Kafir Corn, kä'fĕr kôrn, a plant of the sorghum family. It is a native of south Africa. It is much cultivated by the tribe of Kafirs. It is also called Jerusalem corn It is a sorghum, not an Indian corn. The seeds are borne in a panicle like that of sorghum where the tassel of ordinary corn grows. It was introduced into western Kansas, Oklahoma, and other dry regions about twenty years ago. Its seed value is less than that of corn but the yield is greater. It withstands drouth and dry weather, producing a very fair crop where Indian corn is quite uncertain. Its cultivation is much like that of sorghum. It may be planted in rows or hills, or sowed broadcast. Statistics running through a number of years show that the yield varies from nineteen to seventy bushels per acre, with from one to four tons of fodder. The present area devoted to Kafir corn exceeds 2,500,000 acres. Kansas is the leading state in its production.

Kafirs, a race of black people inhabiting the southeastern part of Africa. They belong to the great Bantu family. They are a black people, but are different from the true negroes. The Kafirs, as well as the Zulus, to whom they are closely related, are a tall, well-formed people, with brown complexions, frizzled hair, and heads of decidedly European shape. They are ordinarily peaceable, yet, when stirred up to warfare, make excellent soldiers. The native weapon is a spear or club. When first known Kafirs carried shields. They rely chiefly on cattle raising and hunting. The women, like those of the North American Indian, raise vegetables and field crops.

Kafir corn, which is raised in the arid regions of the western United States, is extensively cultivated by these people, from whom the name of the grain derives.

Varied spellings of the tribal name are Kaffir, Kaffre and Caffre, though the form preferred by American and English writers is Kafir.

Kalamazoo, a city in western Michigan, fifty miles south of Grand Rapids. It is located on the Kalamazoo River, in the center of a farming district devoted largely to the raising of celery. This crop amounts to over $1,000,000 annually. Manufacturing is the city's chief claim to recognition, the products of which include paper, machinery, engines, windmills, buggies and wagons, corsets, playing cards, patent medicines, and coffins. Several educational institutions are located there,—Kalamazoo College, Nazareth Academy, Barbour College for boys, the central high school, and the Western State Normal school with its capacious buildings and beautiful grounds. There are also several parochial schools and a number of business colleges. Population 1924, 48,858.

Kaleidoscope, an optical toy consist-

ing of a tube in which there are three long narrow mirrors fastened together so as to form an equilateral triangle. In one end of the tube is an eyepiece, at the other are two glass disks between which are placed small pieces of colored glass. When the tube is turned the pieces of colored glass constantly change position, forming beautiful figures whose images are multiplied by the mirrors.

Kalevala. See LITERATURE; EPIC.

Kalmia. See LAUREL; RHODODENDRON.

Kalmucks, a Mongolian people. They number about 200,000. They live in tents, moving from place to place with their herds. They occupy the territory stretching from China through western Siberia into southeastern Russia. Their religion is a form of Buddhism. The Laplanders, now Christianized, and intermarried with Scandinavians, and dependent on herds of reindeer, are thought to have been originally a kindred people.

Kamchatka, käm-chät'ka, a peninsula of eastern Siberia. A similar occurrence of ocean currents gives it a climate much like that of Labrador. The summer is short and warm, the winter long and cold. A range of lofty mountains extends from northwest to southeast. In the number and activity of volcanoes Kamchatka rivals Java. Half a score or more of giants are ranged in a row along the coast. The southern end of the peninsula is covered with forests and the country abounds in furbearing animals. The inhabitants of over a score of Russian villages are engaged in the salmon industry. The north is occupied by a wandering people that live chiefly on the reindeer. See ESKIMO; SIBERIA.

Kamloops, British Columbia, an industrial town and the judicial center of Yale District, is situated at the confluence of the north and south branches of the Thompson River. The town is a port of entry, and served by the Canadian National and the Canadian Pacific railroads, being a division point for the latter. It is 250 miles east of Vancouver and 390 miles west of Calgary, and is the trading and supply center for the large mining and agricultural district of the Thompson Valley. Kamloops was founded in 1811 as a fur trading station and has acquired considerable proportions. Its manufactories issue machine shops and foundry products, cigars, brewery products, canned goods, sashes and doors, and other commodities. The public school system comprises common and high schools; there is a library, a Roman Catholic convent, and an old men's home. The town has an elevation of 1,150 feet, and enjoys a fine climate. In 1921 the population was 4,487.

Kane, Elisha Kent (1820-1857), an Arctic explorer. He was a native of Philadelphia, a graduate of the medical school of the University of Pennsylvania. He held various government appointments as a surgeon, including that to the American Embassy to China, and was enabled to see much of the world. In 1850 he was made senior surgeon to the expedition sent out to search for Sir John Franklin. On his return, he published an interesting account of *The United States Grinnell Expedition in Search of Sir John Franklin: A Personal Narrative.* In 1853 he returned to the Baffin's Bay country. His ship became entangled in the ice north of Smith's Strait in latitude 78° 43′, and was frozen in for twenty-one months. Dr. Kane then abandoned the ship and set out with his companions for the Danish settlements of Greenland 1300 miles distant. This he accomplished by boats and sledges in the short space of ten weeks, with the loss of but one man. *The Second Grinnell Expedition* is a popular account of the perils and privations undergone by the party. See ARCTIC REGIONS.

Kangaroo, a group of animals peculiar to the Australian region. They are described by naturalists as herbivorous, marsupial mammals, which, being translated, means that they live on herbs, suckle their young, and carry them in pouches. The giant kangaroo of the Australian plains is about six or seven feet high. Its head, neck, shoulders, and front legs are slight. The hinder parts are heavy, and its hind legs are very large and muscular. The tail is enormously thick like the thigh of a man, tapering off to a length almost equal-

ing that of the body. The front paws are used more for seizing food, or by the mother in handling the young, than for any other purpose. Instead of standing on its feet, the kangaroo sits on its crooked hind legs and tail. It travels by tremendous hops, clearing from ten to fifteen and even thirty feet of space at a leap, alighting as before on its hind legs and tail. The front feet are not brought to the ground. The skin of the lower belly of the female is thrust inward to form a roomy, comfortable pouch. The young, which are extremely small, immature, and helpless at birth, are placed by the mother in the pouch where they suckle continuously for a time. When they have attained size and strength they play about like the young of any other quadruped, but leap into the pouch again to suckle, or at the slightest signal of danger given by the mother. When kangaroos were first seen by Capt. Cook in 1770 they were tame and could be knocked down with clubs, but constant pursuit by the natives, chasing by dogs, and hunting with guns have made kangaroos exceedingly timid and wary. They are receding farther and farther from the coast into the wilder parts of the continent. Although exceedingly inoffensive the kangaroo shows fight when cornered, and is able to disembowel dog or man with a single blow from one of its powerful, long-clawed hind feet. Kangaroos prefer to go in herds. Their teeth are adapted to nip grass and twigs. There are numerous smaller species of kangaroos. There are also many kangaroo-like animals in this region. They shade off from the true kangaroo to animals not very different, either in size or appearance, from the long-tailed jumping mouse. See AUSTRALIA.

Kankakee, Illinois, a manufacturing city and the county seat of Kankakee County, is on the Kankakee River, 54 miles south of Chicago. It is served by three steam roads and an electric road. The Kankakee River, broad and deep at this point, furnishes water power for the numerous industrial establishments of the city, as well as for the electric light plant and the street railways. The principal manufactures are agricultural implements, pianos, furniture, sewing machines, wagons, bricks, tiles, knit goods, mattresses and starch. Here is situated the Eastern Illinois Hospital for the Insane, and prominent educational institutions are St. Joseph's Academy, a conservatory of music, and at Bourbonnais, a suburb, St. Viateur's College and Notre Dame Academy. The population was 16,753 in 1920.

Kansas, in order of admission, the thirty-fourth state of the Union. The name is Indian, meaning "Swift Wind." Geographically Kansas is the central state of the Union. It lies between Missouri and Colorado, Nebraska and Oklahoma. Save the northeastern corner, which is cut off by the Missouri River, the state is an oblong, lying between the thirty-seventh and fortieth parallels of north latitude, and between 94° 40' and 102° of west longitude. The state is seemingly level. The lowest point is found at the mouth of the Kansas River, 750 feet above the sea. The surface rises imperceptibly but regularly toward the west. The Colorado border has an altitude of about 4,000 feet. There are no mountains in the state, the surface being at most gently undulating. Across the northern part of the state, the Kansas River runs from west to east, joining the Missouri at Kansas City. It is fed by the Big Blue, the Republican, the Soloman and the Smoky Hill rivers, the latter rising in Colorado and draining the central part of Kansas. South central Kansas is drained by the Arkansas River, which flows into Oklahoma at Arkansas City. The Cimarron River, also rising in Colorado, cuts across the southwestern corner of the state and also drops down through Oklahoma.

MINERALS. Though primarily an agricultural state, the gas and petroleum fields of Kansas are important, and there are also small but profitable deposits of coal, lead and zinc. The state contains also an almost inexhaustible supply of material for the manufacture of cement. In the region around Hutchinson are good deposits of salt. The Kansas petroleum industry had a spectacular growth. For a long period the annual production stood at between two and three million barrels,

and was three million barrels in 1914. Then the pools around Augusta, El Dorado and Towanda were opened, and in 1918 the total production was 45,500,000 barrels. By 1920, however, production had somewhat fallen off again. In the latter year the estimated flow of natural gas was 27,000,000,000 cubic feet. The coal and lead deposits are confined to the eastern border of the state.

Agriculture. As to soil and production, the state may be divided roughly into three regions—the eastern, the middle and the western. The eastern section has the greatest rainfall and is the most productive. It is a country of grain fields and orchards. The central portion is the great grain-producing section of the state. The western section, occupying rather more than one-third of the state, is lacking in rainfall. There are extensive tracts of light soil, but, if a supply of water were at hand for purposes of irrigation, there is scarcely an acre of land in the state that might not be made highly productive. Much progress has been made in this dry area in adapting field culture to requirements of the climate. The so-called dust blanket method of cultivation or dry farming prevents evaporation. Kafir corn has been found capable of supplying immense quantities of forage. The most important industries of the state are agriculture and stock raising. About two-fifths of the entire area is under the plow, and all cereals do well. Corn is the chief crop; wheat and oats follow in the order named. About half of the forage, that is to say, winter feed for stock, is supplied by wild grasses cut for hay. Alfalfa, timothy, clover and blue grass thrive in the eastern half of the state. The annual production of beef, poultry, wool, cheese, butter, milk and vegetables is large. The total farm products are estimated at $305,000,000 a year. The northeastern part of the state rivals Missouri in the production of apples. Peach, cherry, plum and pear orchards do well in favored localities and strawberries thrive almost anywhere.

Manufactures. The principal manufacturing industries of the state are meat-packing and milling, in that order. The first is confined almost exclusively to Kansas City, while the latter is of fairly general distribution. After abattoirs and flour mills, canning factories and petroleum refineries are the most considerable industrial plants in the state.

Transportation. No less than five trunk lines of railway traverse the state from east to west. The eastern half of the state is intersected by branch lines running in every direction. There are not to exceed five counties in the extreme southwestern part of the state without railway facilities.

The People. The population of Kansas was 1,769,257 in 1920; about ninety per cent were American. The state is more densely populated in the east, where, the aridity being not so great as in the west, the soil will support more people. The rural is far in excess of the urban population. Kansas has a larger Negro population than have other central western states, because during the agitated period of the Civil War, Negroes flocked into the state from the South. The foreign born inhabitants are largely from Sweden, Austria, England, Germany and Russia.

Institutions. A state board of charities and a state board of correction have charge of the public institutions of Kansas, and also exercise a certain amount of control over such private institutions as receive state aid. The state maintains three hospitals for the insane, one each at Osawatomie, Larned and Topeka; a home for the feeble-minded at Winfield; a hospital for epileptics at Parsons. At Atchison is an orphans' home; at Kansas City a school for the blind; and a school for the deaf at Olathe. The state prison is at Lansing. In this institution the indeterminate sentence, which allows a convicted person to go back into society when he is considered fit to go back, is in force. Two industrial homes, one for boys, at Topeka, and one for girls, at Beloit, are maintained, and at Hutchinson there is a reformatory for young men. A Federal prison is situated at Leavenworth, and a United States Disciplinary Barracks at Fort Leavenworth.

Education. Kansas was settled by an

intelligent class of people to whom the value of education was obvious, and as a result, the educational system of the state is unusually good. The extent to which the population attends to its mental life is attested by the census of illiteracy. In 1920 Kansas had only 1.6 per cent of illiterates, ranking fifth among the states of the Union in this respect and showing a decrease of .6 per cent since 1910.

A state superintendent of instruction is at the head of the public school system, which comprises, besides the primary schools, about 500 high schools, at least half of which give normal training, and a quarter of them training in agricultural methods. At Hays, Emporia and Pittsburgh there are Kansas State Teachers' Colleges.

For higher education there is the Kansas Agricultural College at Manhattan, Baker University at Baldwin, Friends University and Fairmont College at Wichita, Washburn College at Topeka, Ottawa University at Ottawa, the College of Emporia at Emporia, the University of Kansas at Lawrence and a score of other standard denominational colleges.

The university, founded at Lawrence by the Kansas legislature in 1864 and opened in 1866, is maintained by state appropriations, private gifts, student fees and income from land endowments. It consists of the graduate school, college of liberal arts and sciences, a school of fine arts, schools of law, engineering, education, pharmacy and medicine, the summer session and the division of university extension and division of state work. It gives time and service to the public utilities commission and to the state board of health. The university library contains 120,000 bound volumes, and upwards of 50,000 pamphlets. In 1922 there were 303 instructors and the students numbered 4,667.

GOVERNMENT. The constitution under which Kansas is governed dates from 1861, but has been many times amended. Amendments may be proposed by either house; they must be approved by a two-thirds vote of both houses; and they become effective when ratified by a majority of the voters of the state.

The legislature consists of a senate of not more than 40 members elected for terms of four years, and a house of representatives of not more than 125 members, who are elected for two years.

Executive power is vested in a governor, lieutenant-governor, secretary of state, attorney-general, treasurer, auditor and superintendent of public instruction.

The judiciary consists of a supreme court, district courts, probate courts and courts of justices of the peace. The seven justices of the supreme court are elected for six-year terms, and district judges for terms of four years.

Kansas has always been a progressive state. As early as 1880 prohibition was effected, and laws regulating child labor and the sale of tobacco to minors, and pure food laws, have been operative for many years.

HISTORY. With the exception of the southwestern corner, which was acquired from Texas, Kansas forms a part of the Louisiana Purchase. It was visited first by the Spaniards as early as 1541. The Lewis and Clark Expedition passed up the Missouri in 1804. The famous Santa Fe trail was established from Independence, Missouri, to Santa Fe in 1824. The Union Pacific was chartered in 1864. Kansas was organized as a territory in 1854 by the Kansas-Nebraska Act, and was admitted to the Union in 1861. Topeka is the capital. The last United States census reported the population at 1,769,257. There are fourteen cities having a population of 10,000 or more. Kansas City, the largest, has a population, according to the federal census of 1920, of 101,177.

STATISTICS. The following statistics are the latest to be had from trustworthy sources:

Land area, square miles	81,774
Water area, square miles	384
Forest area, acres	200,000
Population (1920)	1,769,257
White	1,708,906
Negro	57,925
Asiatic and Indian	2.426
Chief Cities:	
Kansas City	101,177
Wichita	72,128
Topeka	50,022

Hutchinson	23,298
Pittsburg	18,052
Leavenworth	16,901
Parsons	16,028
Salina	15,085
Coffeyville	13,452
Atchison	12,630
Number of counties	105
Members of state senate	40
Members of house of representatives	125
Salary of governor	$5,000
Representatives in Congress	10
Assessed valuation of property	$3,437,541,808
Bonded indebtedness (1919)	None
Farm area, acres	45,425,179
Improved land, acres	30,600,760
Corn, bushels	102,142,000
Wheat, bushels	128,695,000
Oats, bushels	38,827,000
Barley, bushels	13,200,000
Rye, bushels	1,138,000
Potatoes, bushels	4,160,000
Broom corn, tons	1,700
Wool, pounds	1,878,000
Domestic Animals:	
Horses	1,108,000
Mules	250,000
Milk cows	898,000
Other cattle	2,075,000
Sheep	405,000
Swine	1,810,000
Manufacturing establishments	3,474
Capital invested	$357,534,129
Operatives	61,049
Raw material used	$750,087,987
Output of manufacturics	$913,667,094
Flour, barrels	18,000,000
Meat products	$105,000,000
Coal mined, long tons	7,500,000
Petroleum barrels (42 gals.)	38,601,000
Salt, barrels	873,576
Zinc, tons	20,249
Lead, tons	3,025
Miles of railway	9,386
Teachers in public schools	14,000

Kansas City, Kansas, the largest city in the state and the county seat of Wyandotte County, is situated at the confluence of the Kansas, or Kaw, and the Missouri rivers, 283 miles west and a little north of Saint Louis. It is separated from Kansas City, Missouri, by a single street, through the center of which is the Kansas-Missouri boundary line.

This city is noted chiefly for its numerous large industrial plants situated along the banks of the Kansas or Kaw River, which flows through the city a distance of nearly ten miles and empties its waters into the Missouri River near the state line. These plants supply the principal life to the industrial and commercial activities of the greater Kansas City. They make Kansas City, Kansas, the most important manufacturing city on the Missouri River, ranking seventeenth among the manufacturing cities of the United States. The industries include stock-yards, extensive meat-packing houses, in which nearly 12,000 hands are employed, large soap works, elevators with a combined capacity of more than 6,000,000 bushels, and mills that give the city third rank in flour production, besides implement factories, machine shops, boiler works, steel works, foundries, cotton mills, and the terminal shops for several railway systems.

Kansas City, Kansas, has been builded on the site of the historic Indian village founded by the Wyandottes, in 1843, when they came west from Ohio bringing with them civilization, schools, churches, and a code of laws under which was set up the first civil government for the Kansas-Nebraska territory, then the "Indian Country." The city has many points of historic interest. The old Huron cemetery, wherein lie the bones of the noted chiefs of the Wyandottes, is in the heart of the city. At the foot of Minnesota Avenue, on the old Wyandotte levee, Lewis and Clark landed in 1804 and here for the first time, unfurled the American flag. On the south bank of the Kansas River near the west end of the city is the grave of the Shawnee Prophet, brother of the great Tecumseh and the strangest of all strange characters in Indian history. A few miles up the Kansas River are the old Secondine and Tiblow Indian ferries, the Chouteau trading-posts and the famous "Four Houses" where the French traders dealt with the Indians of the plains more than a century ago, and where General John C. Fremont made his headquarters while making exploration trips across the plains in the first half of the nineteenth century.

The city has a magnificent system of education embracing three public high schools, forty grade schools, a Carnegie library building, and a splendidly equipped public library. There are a Catholic high school and twelve Catholic parochial

schools in the city. The Kansas City University, the Kansas City Baptist Theological Seminary, the Western University and State Industrial School for Negroes, the Medical College of the University of Kansas and the Kansas School for the Education of the Blind, are among the city's other great educational institutions. The city is under the commission form of government and has an extensive system of parks, playgrounds, and boulevards. The population in 1920 was 101,078.

Kansas City, Missouri, the second city of the state, ranking next to St. Louis, is the county seat of Jackson County, and is the second live-stock market and meat-packing city in the United States. The city is situated at the confluence of the Missouri and the Kansas (or Kaw) rivers. It is the twentieth city in size in the United States. It is served by seventeen railroads, including the Santa Fe, Union Pacific, Wabash, Chicago, Milwaukee & St. Paul, Missouri Pacific, Missouri, Kansas & Texas, Burlington, Chicago & Alton and the Rock Island. Kansas City also has water transportation to the Gulf of Mexico by way of the Missouri and Mississippi rivers. Transportation by rail has been greatly facilitated by the construction of four steel bridges across the Missouri.

Parks, Boulevards and Buildings. The main portion of the city rises from the river in three great terraces, the first being the bluffs above the stream. The lowest terrace is occupied by warehouses and wholesaling and manufacturing establishments; the second terrace is the business district; while the third and highest, as well as the most beautiful, is the residential section. Constant improvement has put Kansas City in the ranks of the most beautiful cities in America.

It has a park and boulevard system rivaling that of any other city in the United States. The splendid driveway on the bluff overlooking the river and known as Cliff Drive, the Paseo, and Kersey Coates Drive are well known. The largest park in the system is Swope Park, containing 1,380 acres; the smaller parks are no less delightful.

Probably the finest building in the city, as well as one of the newest, is the Union Station, an imposing structure erected at a cost of six million dollars; it is one of the finest railroad terminals in the United States. Convention Hall, Board of Trade, Federal Reserve Bank Building, Live Stock Exchange, City Hospital, Federal building, Y. M. C. A., and many of Kansas City's hotels—all are notable. The most noteworthy churches are the First Baptist, First Congregational, Jewish Temple, Roman Catholic Cathedral, Christian Science, Calvary Baptist, Trinity Episcopal and Redemptionist Fathers.

Industry and Commerce. Meat-packing is the principal industry of Kansas City, and live stock constitutes the most important item of its extensive trade. The city is the greatest winter wheat market in the United States and ranks third as a market for other grain. The capacity of its grain elevators is approximately 25,000,000 bushels; flour milling is also one of the important industries. Hay, mules, lumber, coal, cement and lime are other important articles of commerce. The metallurgical industries, though not extensive, are important. Petroleum refining has been carried on in or near Kansas City for many years.

Education. Kansas City possesses an educational equipment that is modern to the last detail and is fully adequate. There are about 100 public schools, graded and high, as well as parochial schools, preparatory schools and special schools of music, commerce, medicine, engineering, law and dentistry. There are also a number of private schools. A girls' industrial home and a farm for boys are provided to care for neglected and delinquent children. At Kansas City, Kansas, just across the river, is the University of Kansas City; at other towns nearby are Park College, Baker University and William Jewell College. The city contains a fine public library.

History. Kansas City originated in a fur trading post called Westport Landing, and when the town was organized in 1838 the word Kansas was spelled *Kanzas,* after the Kanzas tribe of Indians. Kansas City was on the famous Santa Fe Trail, and once had almost the entire trade of New

Mexico, which was chiefly in live stock. In 1860 this modern, busy city was a town with only 4,418 inhabitants; in 1920 the population was 324,410.

Kansas-Nebraska Bill, an act passed by Congress in 1854. It was introduced by Senator Stephen A. Douglas, the chairman of the committee on territories. The bill was signed by President Pierce on May 30th. The principal feature was a clause to the effect that, when any part of the territory included under the provision of the act should be admitted to the Union, it might come in free or slave as its inhabitants should decide. This bill was a repeal of the Missouri Compromise which had provided that no slave states should in the future be admitted north of the parallel of 36° 30′. The passage of the bill created intense excitement and led to a systematic colonization of Kansas by anti-slave people from New England as well as slaveholders from Missouri. For an account of the border warfare that followed, see BROWN, JOHN.

Kansas River, a river of Kansas, which is formed by the junction of the Smoky Hill and Republican rivers in Geary County, from which it flows in an easterly direction, emptying into the Missouri River at Kansas City. The basin of this river comprises the most fertile part of the state, a large variety of crops being produced. The banks of the river are sandy, and the channel is usually close to one shore or the other. The Blue River is the chief tributary, this rising in southeastern Nebraska, flowing southeast and south, and joining the Kansas at Manhattan. Two other important tributaries are the Saline and the Solomon rivers. The cities of Lawrence, Junction City and Topeka, the state capital, are situated on its banks. The Kansas River has a length of about 650 miles, this including the Smoky Hill branch, which takes its rise in the Rocky Mountains.

Kant, Immanuel (1724-1804), a German philosopher. He was born in Königsburg, Prussia, on the Baltic. He was educated there, and held later a professorship in the university of his native city. He was a remarkable student. As Socrates could hardly be induced to go beyond the walls of Athens, so Kant clung with oyster-like tenacity to the city of his birth, never leaving it through the thirty years of his professorship. He remained a bachelor all his life. He is considered one of the world's greatest thinkers. The range of his studies may be learned from the fact that, before settling down to metaphysics or mental philosophy, he lectured on logic, mathematics, physics, and physical geography. His system of philosophy is too difficult a subject to be understood readily. It is perhaps sufficient to say that he begins by dividing all knowledge into two classes: first, that which is born in us, or which would come by pure thinking to a blind, deaf person—one shut off from the world. Ideas of space and time are of this sort. Other knowledge, as the fact that fire will injure the finger, is derived from experience. Knowledge independent of experience is *a priori.* Knowledge born of experience is *a posteriori.* Kant's greatest work is *The Critique of Pure Reason.* Pure reason he defined to be the faculty of understanding by *a priori* principles. Since Kant's death there have been explanations, defenses, and attacks of his system quite numerous enough to fill a large library. See HERBART.

Kaolin, kā′ō-lĭn, a kind of potter's clay. The name is derived from the Chinese Kaoling, meaning lofty hill. Kaoling is the name of a particular hill in China from which large quantities of porcelain clay are dug. All such clays, wherever found, are now called kaolin. It is derived from rock that has disintegrated without having been disturbed. The particles are flattish like scales and do not work in the fingers, that is to say, are not plastic like putty. Kaolin is free from grit. China ware, Japanese ware, Sevres wares, Dresden China, English ironstone china; in short, all the chinaware of the world is made from kaolin. It is akin to chalk. Valuable deposits are rare. Kaolin is mined in Alabama, Georgia, Massachusetts, North Carolina, South Carolina, Florida, and several other states; but we still import about 100,000 tons of superior kaolin each year for our chinaware factories. See CLAY; POTTERY; PORCELAIN.

Karakorum, or Mustagh, Mountains, a range in central Asia which forms the extreme northwestward extension of the Himalaya Mountains. It traverses the country which lies between Kashmir and Eastern Turkestan, on a high table-land which is referred to frequently as "the roof of the world." The great Pamir plateau is formed by the Karakorum Mountains together with the Pamir, Suleiman, Elburz and Tian Shan ranges. The Karakorum Mountains branch off from the Himalyas near the headwaters of the Indus and extend along the right bank of that river through the whole of its northwest course, and cover the northern half of the Province of Kashmir, India. This range is composed of a number of lofty ridges, the valley bottoms being from 10,000 to 15,000 feet above sea level. Some of the highest peaks in the world are here, and enormous glaciers flow from them. Mount Godwin-Austen is 28,265 feet above the sea level, and there are many others with a height over 25,000 feet. Lofty passes connect some of the valleys, one of which, the Karakorum Pass, has an altitude of 18,550 feet.

Karnak. See THEBES.

Kaskaskia, the oldest town in the Mississippi Valley. It is situated in Illinois near the junction of the Kaskaskia and the Mississippi rivers. In 1700 the Jesuits, under the guidance of Tonti, established a mission here. They built a college and a convent. The French built a fort called Chartres here, and made the town their western capital. A considerable trade in furs and other Indian produce was built up by way of the Mississippi with Orleans. The French throughout the West sent their young people to be educated here. Kaskaskia was their social center. At certain seasons, the little town was thronged with visitors. What with Indians, traders, missionaries, students, young men of the college, and young ladies of the convent, residents, garrison and officers, the little town was full of life and gaiety. The French called it the "Paris of the West." In 1763 it was one of the posts that fell into the hands of the English, who made it their western capital. July 4, 1778, it was captured by George Rogers Clark with a company of Virginia militia. Kaskaskia was for many years an important city. It was the territorial capital of Illinois and remained the capital of the state until 1818. The town was founded on bottom lands about three miles above the mouth of the Kaskaskia River. The Mississippi for years continued to eat its way toward the old town. In 1892 it cut across into the Kaskaskia, converting a large part of the old site into an island which a few years later crumbled and was swept away. The historical buildings are all gone. In 1891 the ancient cemetery was removed to a point on the bluffs, where an appropriate monument commemorates the memory of Kaskaskia. It is, indeed, a vanished capital. See CLARK.

Katahdin, ka-tä'din, the highest mountain in Maine. It attains an altitude of 5,385 feet. It is a granite peak. Its summit is without vegetation, save lichens and a few other plants of dwarf growth. Its sides bear glacial scratches produced during the prevalence of an ice age. Blocks of stone, evidently from the north, bear witness to the former presence of a glacier. The summit gives one a magnificent panoramic view of lake, river, and forest. Thoreau makes much of the Katahdin in his *Maine Woods.*

Kato, Admiral Baron Tomosaburo (1859-1923), was head of the Japanese legation to the conference on Limitation of Armament held at Washington. Previously he had received only slight international reputation, although he was well known in Japan and some European countries.

Admiral Kato's naval record dates back to 1883, when he became a midshipman. He had attained the rank of captain in 1899, and was appointed professor at the Naval Academy, serving as sectional chief and construction supervisor. In 1902 he became chief staff officer of the standing squadron.

Kato's first great moment came during the Russo-Japanese War in 1905, when the Japanese fleet under command of Admiral Togo and his Chief-of-Staff, the then Rear-Admiral Tomosaburo Kato, defeated the Russian fleet. At the close of this war Kato became a bureau chief, be-

ing promoted to the office of vice-admiral in 1908, and commander of the Kure admiralty in 1909. In 1914 he commanded the Japanese fleet which attacked the Germans at Tsing-Tsao.

Later Kato became Minister of the Navy, which position he has held through three changing cabinets, and he is known as the father of Japan's modern fleet. Therefore, it is only logical that Japan should have selected him to head the Japanese delegation to the convention at Washington. In 1915 Baron Kato was elected to the House of Peers, and in 1922 succeeded to the premiership of Japan.

Kato, Yakaakira, Baron (1859-1926), a distinguished Japanese statesman, was born at Nagoya. He was educated at the University of Tokyo, and after graduation entered the services of a steamship company. This position he left in 1888 to become private secretary to Count Okuma, Minister of Foreign Affairs. In 1891 Baron Kato became director of the bureaus of banking and taxation in the Finance Department of the Japanese government. During 1894-99, and 1908-13, he was Japanese envoy to Great Britain. During this time Baron Kato had been made Minister of Foreign Affairs, serving in 1900-01, in 1906-13, and in 1914-15. In 1904 he secured control of the newspaper *Nichi-Nichi,* and since that time has in large measure directed the course of Japanese public affairs.

Katsŭ Awa, (1820-96), a Japanese statesman, was born at Shidzuoka, Province of Suruga. He was of a studious disposition, and made himself familiar with the literature of China, Japan and Holland. He was in command of a company of soldiers in the army that guarded the country at the time of Perry's landing in 1854. He was sent to Nagasaki in 1855 to learn from the Dutch how to manage steam vessels, and made such rapid progress that in 1861 he navigated the first Japanese steamship across the Pacific ocean, and to him was due the building of the first Japanese man-of-war along the line of foreign models. Katsu Awa stood high in the councils of his government, and contributed not a little to bringing Japan to the position which it now holds. He became Minister of the Navy Department, but resigned in 1874, to devote himself to study. He wrote a history of the modern Japanese navy.

Katrine, Loch, lōk kăt′rin, a celebrated Scottish lake. It lies near the southwestern border of Perthshire. It is reached by a daily stage route from the nearest railway points. A steamer for the accommodation of tourists runs from one end of the lake to the other. The lake is about eight miles long and three-fourths of a mile in breadth. Its shores are variegated. Two mountains, Ben An and Ben Venue, rise from its banks. Near the southeastern end is Ellen's Isle, celebrated in Scott's *Lady of the Lake.* The natural outlet of the lake is through the Trossachs, but this passage has been closed by a dam. An underground tunnel over twenty-five miles in length leads to Glasgow, furnishing that city with an abundant supply of excellent water. A pathway leads from Loch Katrine to Loch Lomond near the northern foot of Ben Lomond. See SCOTT.

Katydid, an insect of the locust family. The katydid lives in trees, feeding on foliage. It lays its eggs on twigs or leaves. Its body is pale green. As in the case of the green grasshoppers, which it much resembles, the ears of the katydid are situated on the front legs, below the knees. It smells with its long, delicate antennae. The wing covers overlap, and when rasped or rubbed the one on the other, produce the clear, energetic, "katydid, katydid," which gives the insect its name. Oliver Wendell Holmes expresses his appreciation in his oft quoted lines, *To An Insect.*

I love to hear thine earnest voice,
Wherever thou art hid,
Thou testy little dogmatist,
Thou pretty katydid!
Thou mindest me of gentlefolks,—
Old gentlefolks are they,—
Thou say'st an undisputed thing
In such a solemn way.

See GRASSHOPPER; LOCUST.

Kean, keen, **Edmund** (1787-1833), a celebrated English actor. He was a native of London. His mother was an actress, his father a stage carpenter. He was literally born to the stage. He began acting when a mere child. His first genuine success

came to him in London in 1814, when he appeared in Drury Lane as Shylock. He took the city by storm. Seats were at a premium. He was equally successful as Othello, Richard III, and Sir Giles Overreach. He made several tours, visiting America twice. He acquired intemperate habits, and broke down in 1833 while still a young man. He is considered one of the greatest actors that ever appeared on the London stage. He was succeeded by his son Charles, who attained reasonable success in his father's chosen profession.

Kearny, Stephen Watts (1794-1848), an American soldier. He was born at Newark, New Jersey. At the age of eighteen he entered the army as lieutenant, and won distinction in the battle of Queenstown Heights in 1812. When the Mexican War broke out, Kearny was made commander of the "Army of the West," which conquered New Mexico. After establishing a provisional government in Santa Fé he went to California under instructions to set up a civil government in that country, newly conquered by the United States. Kearny found Stockton and Fremont in possession, but proclaimed himself governor in March, 1847. In June he was ordered to Mexico. The next year he became governor of Vera Cruz, and later of Mexico City. There he fell ill of a fever which caused his death in the United States a short time later.

Kearsarge, kēr'särj, the name of a mountain in Carroll County, New Hampshire, belonging to the White Mountains, from which was named the vessel that sunk the Confederate cruiser, Alabama, in 1864. Another mountain in Merrimac County bears the same name. See ALABAMA, THE.

Keats, keets, **John,** (1795-1821), an English poet. He was the son of a London stablekeeper, but was early left an orphan. He was educated as a physician, but, beyond practice in a London hospital, gave himself up to writing poetry. He suffered from consumption. In 1820 he went to Italy for his health. He died at the age of twenty-five. It is said that bitter, uncalled for criticisms in the reviews of the day hastened his death. During his lifetime he was closely associated with the poet Shelley, whose *Adonais,* written in memory of Keats, ranks as an elegy with Milton's Lycidas. It may be regarded as Keats' monument. Keats and Shelley lie together in the Protestant burying ground in Rome. In his *Golden Treasury of Songs and Lyrics* Palgrave finds room for thirteen of Keats' shorter poems. Keats' longer poems are *Endymion, Hyperion,* and *Lamia.* The more noted of his shorter productions are *Ode to a Nightingale,* and *Ode to a Grecian Urn.* Although Keats is not the poet of young people, his *Eve of St. Agnes,* founded on an old Scotch superstition, is not difficult. It is certainly one of the most perfect poems in the English language. Keats' oft quoted sentence, "A thing of beauty is a joy forever," is found in his *Endymion.*

No poet who has done so little, bears a higher fame.—Mrs. Oliphant.

No one else in English poetry, save Shakespeare, has in expression quite the fascinating felicity of Keats, his perfection of loveliness.—Matthew Arnold.

Keats, with his love of beauty as yet passionate and unrestrained, delighting chiefly in the graceful flow and music of sweet words, has given us verse which sometimes cloys.—Pancoast.

Keene, N. H., the county seat of Cheshire County is on the Ashuelot River, and on the Boston & Maine Railroad, 43 miles southwest of Concord. It is in the beautiful Cheshire Hills, and ten miles distant Mount Monadnock rises to a height of 3,186 feet. Keene does a considerable trade in lumber and farm products, and in its factories are made tubs and pails, furniture, shoes, toys, sashes and doors, toilet articles and pottery. The Boston & Maine Railroad maintains shops here. Keene was settled under the name of upper Ashuelot, adopting its present name when incorporated in 1753. It contains a Y. M. C. A., a Federal building, state normal school, high school, several fine parks, a new $270,000 hospital, a public library and 10 churches. The population was 11,210 in 1920.

Keller, Helen Adams (1880-), a remarkable blind deaf-mute, who, in spite of her limitations, has acquired an excellent education and no little reputation as a writ-

er. She was born in Tuscambia, Alabama. At the age of nineteen months she had scarlet fever, which left her blind and deaf. No effort was made to educate her until she was about seven years old, when Miss Anna Sullivan, of the Perkins Institution of Boston, became her teacher. She began by winning the child's interest and affection. The first word the little girl learned was "water," traced in the palm of her hand by her teacher whenever she drank water. When Helen realized what this meant—that the lines traced in her hand stood for that which quenched her thirst—the first great step was taken. After this her progress was rapid. Although she had been somewhat wayward and selfwilled, she became most tractable, her eagerness for knowledge outweighing everything else. She learned to read and write and to use the finger alphabet. Then she determined to learn to talk. Sarah Fuller, of the Horace Mann School of New York, became her teacher. The pupil was made to place her hand on her teacher's throat while the teacher spoke; then placing her hand on her own throat, Helen would try to imitate the sound, her delicate sense of touch enabling her to know when she was right. In less than a month, incredible as it seems, she had learned to talk intelligibly. Later Miss Keller attended the Wright Humason School, then the Cambridge School, and in 1900 entered Radcliffe College. She has written many magazine articles, and an account of her education in *The Story of My Life.*

Kelowna, a town in the Yale District of British Columbia, is situated on Okanagan Lake, 80 miles south of Sicamous and 64 miles north of Okanagan Landing, where steamer connection is made with a branch line of the Canadian Pacific Railroad. The climate of the region is dry and mild; agricultural land about the city is very productive, the apples grown here being of an especially good quality. Kelowna has manufactories of sashes and doors, boxes, canned fruits, cigars and finished lumber. There are good public schools, including an agricultural school, a manual training school and a school of domestic science. In 1921 the population was 2,517.

Kelp, a general name for large seaweeds. The name is frequently restricted to a particular species whose long, slender fronds or floating blades not infrequently attain a length of 600 feet. Kelp thrown upon the beach by storms is dried in the sun and burned.

Kelts. See CELTS.

Kelvin, Lord. See THOMPSON, SIR W.

Kemble, Frances Anne (1809-1893), a famous English actress and author, best known as Fanny Kemble, was born in London and educated in France. Miss Kemble made her first stage appearance at Covent Garden, London, in 1829, in the role of Juliet. This appearance was followed by an unbroken series of successes as Portia, Beatrice, Lady Teazle, and in other parts until she was finally compared with her famous aunt, Mrs. Siddons. Her greatest triumph, however, was in the part of Julia in Sheridan Knowle's play, *The Hunchback.* Miss Kemble appeared in America in 1832, and repeated her successes. Returning to London in 1847, she subsequently resided in England, on the Continent and later in America. She is the author of *A Record of Girlhood, Francis the First; An Historical Drama, A Record of Later Life, Poems* and *Notes Upon Some of Shakespeare's Plays.*

Kemble, John Philip (1757-1823), a noted English actor. He was a native of Lancashire. He completed his education in the English Catholic College of Douay in France. In 1783 he won success at Drury Lane in the character of Hamlet. Brutus and Coriolanus were favorite characters with him. He became the manager of the Drury Lane Theater, also a stockholder in Covent Garden Theater. He left the stage in 1817, at which date a public dinner was given in his honor. His later years were spent in Switzerland. The famous Mrs. Siddons was a sister of John Kemble, and their niece, Frances Anne Kemble, became a popular actress. Fanny Kemble, as she was known, appeared on the stage at Covent Garden in 1829, as Juliet, in which part she scored a great success. Portia and Lady Teazle were also favorite roles. She was well received in America, to which country she made several trips. She was the author of several dramas and of a volume of poems.

Kemp, Sir Albert Edward (1858-), a Canadian statesman, was born at Clarenceville, Quebec, and educated there and at Lacolle Academy. Entering upon a business career, Sir Albert became president of the Sheet Metal Products Co. of Canada and director of the National Trust Co. Later he succeeded to the presidency of the Canadian Manufacturers' Association and of the Toronto Board of Trade. His first essay into the political field was made in 1900 when he was elected to Parliament for East Toronto, serving until 1908, and again from 1911 to 1921. Sir Albert was minister without portfolio from 1911 to 1915; Minister of Overseas Military Forces of Canada during 1917-20; and a member of the Imperial War Cabinet in 1918. Again during 1920-21 he served as minister without portfolio, and was afterwards appointed to the Senate, 1921.

Kempis, Thomas à (1379-1471), a German monk. He was born in the village of Kempen in the diocese of Cologne. In 1400 he entered an Augustinian convent. He became a monk in 1406. He spent his entire life in seclusion. He is noted as the author of a book of private meditations entitled *The Imitation or Following of Christ.* It was written, as all books of that day were, in Latin language. In his history of *Latin Christianity* Dean Milman says, "in it is gathered and concentrated all that is elevating, passionate, profoundly pious in all the older mystics. No book after the Holy Scriptures has been so often reprinted; none translated into so many languages, ancient and modern." The first printed edition appeared in Augsburg in 1486. A collection preserved at Cologne, near the place of his birth, includes over 500 separate editions. The *Imitation* is a book that will find readers in every age.

Kendall, Amos (1789 - 1869), an American political leader who as Postmaster-General introduced many improvements into the postal service, the chief of which was the money-order system. Mr. Kendall was born at Dunstable, Mass., taught school and studied law in Groton, Mass., and after removing to Kentucky in 1814 was tutor in the family of Henry Clay. Admitted to the Kentucky bar, he became editor of several newspapers, one of which was the chief Jackson organ in Kentucky. After Jackson's election to the Presidency, Mr. Kendall went to Washington and became one of the strongest figures in the famous "Kitchen Cabinet," and was influential in shaping the policy of the administration. President Jackson appointed Mr. Kendall Postmaster-General in 1835, in which office he continued until near the close of President Van Buren's term. He administered the office with skill and integrity. After retirement, Mr. Kendall edited newspapers in Washington for several years, and finally amassed a fortune through his connection with Samuel Morse in telegraph development. During his later life Mr. Kendall took an active interest in numerous philanthropic enterprises.

Kenesaw Mountain, Battle of, an important engagement of the Civil War during Sherman's march to the sea, was fought at Kenesaw Mountain, in Cobb County, Georgia, on the 27th of June, 1864. The Confederate forces, under General Johnson, numbering about 60,000 were retreating before Sherman's army of 95,000, and, determining to make a stand, entrenched themselves on the mountain. The Federals under Logan and McCook attacked the Confederate position, but met with a defeat. General McCook lost his life in this battle.

Kenilworth, a market town in Warwickshire, England. It is noted chiefly for the neighborhood of Kenilworth Castle. This stronghold was presented by Elizabeth to Robert Dudley, Earl of Leicaster. In 1575 he entertained his queen here for seventy days at a daily expense, it is said, of $5,000. There are still extensive remains of the castle, hinting somewhat at its former magnificence. They are covered with ivy, and serve as nesting places for swarms of jackdaws and rooks. The castle is well described in Scott's novel, *Kenilworth.*

Kennan, George (1845-1924), an American author and lecturer. He was born at Norfolk, Ohio. He became a telegraph operator and in 1865 went to Siberia as a telegraph engineer, in the employ of the Russo-American Telegraph Company. Several years later he explored the region

of eastern Caucasus, and in 1885 and 1886 was sent out by *The Century* with the artist, G. A. Frost, to investigate the Russian exile system. He traveled 15,000 miles in northern Russia and Siberia. The results of his observations were published in the *Century Magazine* and later appeared in book form. Kennan lectured on the exile system both in England and America. His books include *Siberia and the Exile System, Tent Life in Siberia,* and *Campaigning in Cuba.*

Kennebec River, the second largest river in the state of Maine, is an excellent waterpower stream about 160 miles long. It rises in Moosehead Lake, situated in the west-central part of the state, and flows in a southerly direction, emptying into the Atlantic Ocean twenty-five miles northeast of Portland. The Kennebec has a drop of 1,026 feet from head to mouth; the main falls are at Augusta. For a distance of twelve miles from its mouth the river is navigable for large vessels; and smaller boats penetrate as far as Hallowell, 40 miles, during the summer months.

Kennedy, John P. (1795-1870), an American novelist. He was a native of Baltimore. While a mere lad he served in the War of 1812. In 1816 he was admitted to the bar and was considered a successful lawyer. He served three terms in Congress, and in 1852 became secretary of the navy. He is remembered, however, chiefly as a writer. In 1832 he published *Swallow Barn, or Sojourn in the Old Dominion.* This tale described plantation life in old Virginia and was well received. Kennedy's reputation rests, however, on *Horseshoe Robinson, A Tale of the Tory Ascendency.* It is a story of the Revolutionary War. It appeared in 1835. Kennedy was a friend of Thackeray, in fact, he may be called "the American friend of the novelist." He assisted him in the preparation, if, indeed, he did not compose, the fourth chapter of the second volume of *The Virginians.*

Kenora (formerly Rat Portage), Ontario, the industrial and judicial center of Kenora District, is situated on Lake of the Woods, 133 miles east of Winnipeg and 293 miles northwest of Fort William. The city has steamer service on the lake and on Rainy River, and is served by the Canadian Pacific Railroad. Kenora is an important center of the lumbering industry, and also has manufactories of pulp and paper, boats, flour and sashes and doors. Gold is mined in the vicinity. The most notable buildings are the Anglican and the Roman Catholic cathedrals, the hotels and the courthouse. The public school system is modern. In 1921 Kenora had a population of 5,407.

Kenosha, Wis., an industrial city, and the county seat of Kenosha County is on Lake Michigan, 34 miles south of Milwaukee. It is on the Chicago & Northwestern Railroad, on two interurban electric railways, and Sheridan Road, an automobile highway, passes through. It has a good harbor, and is connected by boat with important lake ports. In the city are manufactured automobiles, beds, brass goods, wagons, automobile lamps, underwear, hosiery, furniture and tanned leather. It contains a Federal building, a public library, Kemper Hall School and fine public schools. The water works are municipally owned. Population in 1920, 40,472.

Kensington, a locality of London, about four miles west of St. Paul's, and immediately west of Hyde Park. Kensington Gardens, a beautiful public park, comprises about 350 acres. Kensington palace was for many years a favorite royal residence. Queen Mary, William and Anne, and George II died here. Several museums designed to relieve and supplement the British Museum are located at Kensington. Albert Memorial, a monument erected by Queen Victoria in remembrance of her husband, the prince consort, stands at the southern entrance to the Gardens.

Kent, James (1763-1847), an American jurist. He was born at Fredericksburg, New York. After a course at Yale University he studied law and in 1785 began its practice in Poughkeepsie. He won reputation shortly for his literary as well as for his legal attainments. He served two terms in the New York legislature, becoming an active leader of the Federalists. Removing to New York City in 1793, Kent was appointed one of the two masters in chancery for the city, and was elected

professor of law in Columbia College. In 1797 he was appointed city recorder, and the following year, judge for the Supreme Court of New York. In 1804 he was made chief justice and in 1814 chancellor of the state. When his term of office expired in 1823 Kent resumed his professorship at Columbia College, and three years later published *Commentaries on American Law,* a work which has passed through fourteen editions, and takes the place in the United States that Blackstone's *Commentaries on the Laws of England* holds in Great Britain.

Kent, an important county lying in the southeastern angle of England. It lies between the Thames and the Strait of Dover. It is a rich agricultural country. It produces great quantities of vegetables for the markets of London, and is one of the great hop-raising regions of England. Historically, the country is the center of the ancient kingdom of Kent formed by the Jutes. The insurrections of Wat Tyler, Jack Cade, and Sir Thomas Wyatt emanated from Kent. The cathedrals of Rochester and Canterbury are in this county. See CANTERBURY.

Kenton, Simon (1755-1836), an American backwoodsman. He was a native of Virginia. At the age of sixteen, believing that he had killed a young man in an affray, he fled over the mountains to Kentucky and joined Boone. Later he heard that his opponent was living. He then went back and brought over his father's family. He was a true shot with a rifle, a runner of endurance and speed, and a skillful Indian fighter. The stories of his marvelous escapes rival those of Boone himself. At one time he was taken prisoner. The Indians had a fire built to roast him at the stake. They decided to have him run the gauntlet first between two long rows of warriors, who stood ready to strike and slash him. He succeeding in breaking through the line and in escaping through the forest. He was foremost in the Indian warfare of the Ohio Valley until the region was set at peace by Wayne's victory in 1794. He had no faculty for the management of business. In his old age he fell into poverty and neglect. The title to his land was in doubt. He appeared in person before the legislature of Kentucky. The members, belonging to a younger generation, were disposed at first to smile at his ragged appearance, but, on being reminded of his services, treated him with respect, cleared the title to his property, and saw to it that he was granted a pension of $20 a month by Congress. He died in Logan County, Ohio. The town of Kenton on the Scioto was named in his honor.

Kent's Hole or **Cave,** a large cavern in the limestone rock near Torquay, Devonshire, England. It extends into the limestone cliff a distance of about 600 feet, and is from three to eighteen feet in height. The floor is covered with stalagmite formations, in the clay beneath which antiquarians have found a remarkable collection of flint implements and of the bones of the prehistoric cave bear, hyena, etc.

Kentucky, one of the south-central states of the United States, derives its name from a Cherokee Indian word that means "prairie," and probably had reference to the many grassy glades of the state. The most common, and a very descriptive, name of Kentucky is "The Blue Grass State." A name less frequently met with is "The Dark and Bloody Ground," a name deriving from the many sanguine conflicts between the early settlers and the Indians.

The state is very irregular in outline, the sinuosity of the Ohio River giving the northern border a length of 600 miles. The southern border, however, is quite straight except in the extreme southwest corner. The state has a total area of 40,598 square miles. From east to west the greatest length is 500 miles; from north to south 171; but from Paducah, north, to the southern border, the distance is only 40 miles.

SURFACE AND DRAINAGE. The surface of Kentucky is primarily a plateau with an average elevation of 800 feet above sea level. It slopes gently northward and westward, toward the Ohio and Mississippi rivers. But there are several markedly individual physical sections in the state. The north and central portions of Kentucky are gently rolling, hill and valley following each other in pleasant succession. Here is

the Lexington Plain, the famous blue grass section, with an area of about 10,000 square miles, surpassingly fertile. The luscious grass, tinged to blue by the seed pods, spreads over the low hills and into the valleys as far as the eye can see.

The southeastern part of the state is mountainous; the Alleghany Mountains here belong to the Appalachain system. The Cumberland Mountains, another system, extend along the greater part of the southeastern border. They contain the highest peak in the state, Big Black Mountain, 4,100 feet high. Farther west than the Cumberland Mountains and running nearly parallel with them is the shorter chain known as the White Mountains. The beautiful Cumberland Valley lies between these two ranges. This region possesses great scenic beauty. In the southern part of the state is Mammoth Cave (which see).

Rivers and Forests. Northwestwardly is the direction in which all the rivers of Kentucky flow. The most of them rise in the mountains or on the Alleghany plateau, and empty into the Ohio. Kentucky's important rivers, from east to west, are the Big Sandy, Licking, Kentucky, Green, Cumberland and Tennessee. The Ohio is, of course, navigable along the entire Kentucky border, and almost all of the lesser streams are navigable for some distance upward from their mouths.

Formerly, Kentucky was almost entirely forested, and even yet has a forest area of 9,000,000 acres. These forests, consisting largely of hardwood, are very valuable. Walnut, cypress, white and yellow pine, spruce, sweet gum, maple, beech, elm, ash, oak and cedar are found.

The People. Kentucky's inhabitants, numbering 2,416,630 in 1920, were divided between white and Negro roughly in the proportion of nine to one. The total population is slightly smaller than that of Wisconsin, and the density is 60.1 to the square mile. There is but one city with a population exceeding 100,000, and only two exceeding 50,000. The capital, Frankfort, is ninth in size among Kentucky cities.

Minerals. The mineral resources of Kentucky are extensive and valuable and include coal, petroleum and natural gas, iron, fluospar, cement rock and pottery clay. Bituminous and cannel coal of an excellent quality are mined in such quantities that Kentucky usually ranks fifth among the coal producing states. The coal areas are two in number, one in the northwestern part of the state, the other in the eastern and southeastern section. Petroleum and natural gas are of rather wide distribution. Though the quantity of petroleum obtained is not large, the quality is very good. Both Portland and natural rock cement are abundant, and large quantities of iron and fluospar are mined.

Agriculture and Stock Raising. The two principal crops of Kentucky are corn and tobacco. The greatest acreage is given to corn, and this crop is usually the most valuable. Of almost 14,000,000 acres of improved land in the state in 1921, 3,209,000 were planted in corn; and in that year the value of the crop was $45,182,000.

In the southwest corner of the state is the famous "black patch," undoubtedly the most productive tobacco growing section. In the blue grass section is the burley district, producing the light leaf extensively used in the manufacture of smoking and chewing tobacco.

Kentucky leads the United States in the production of this crop. In 1921 the yield was 325,710,000 pounds valued at $50,485,000. This yield exceeded that of the next state, North Carolina, by about 31,000,000 pounds, and represented roughly one-third of the total crop of the United States.

Wheat is another important crop, and is followed by hay and forage crops, oats, sweet potatoes, sugar cane, potatoes and hemp. Of the latter crop, Kentucky produces about ninety per cent of the total for the United States. Orchard fruits and berries of fine quality are grown in abundance.

Horses and cattle thrive in the blue grass country. The rich soil and mild climate that produces Kentucky's tobacco also favor the growth of its excellent pasturage. Cattle may be left in the fields

almost all winter. The thoroughbred horses of Kentucky are justly famous, and have had and still have famous representatives on the American turf. Mules are raised to about half the number of horses, and sheep and swine in about equal numbers.

MANUFACTURE. Formerly, Kentucky produced great quantities of whisky, but that industry is dead. The manufacture of tobacco products is important, and the lumber industry has enjoyed a steady growth for some years. Leather and leather goods are produced, and lately the metallurgical industries have acquired importance. This latter was a logical development in a state possessing coal, iron, petroleum and natural gas and potential hydroelectric power.

TRANSPORTATION. In the state are nearly four thousand miles of steam road and about five hundred miles of electric lines. The principal railroads are the Southern, Illinois Central, Louisville, Henderson & St. Louis, Chesapeake & Ohio, Louisville & Nashville and Cincinnati, New Orleans & Texas Pacific. Water transportation is ample, and the roads of the state, especially those in the north, are good. The Dixie Highway runs across the state from Louisville to the Tennessee border.

INSTITUTIONS. Kentucky maintains institutions for the education of the deaf and blind, and a tuberculosis hospital and tuberculosis colony. The state prisons are at Eddyville and Frankfort. At Pewee Valley is the Confederate Soldiers' Home. At Frankfort there is a Home for Feeble Minded Children; and the state hospitals include the Eastern State Hospital, Lexington; Central State Hospital, Lakeland; and Western State Hospital, Hopkinsville. A State Board of Control is at the head of the correctional and charitable institutions.

EDUCATION. Primary education has been strictly compulsory since 1912, before when the educational conditions and facilities were not satisfactory. By the census of 1910 the number of illiterates in Kentucky was quite large, and in the effort to overcome this defect illiteracy commissions, with quite large powers, were created in 1914 and 1918. The first night schools for illiterates were opened in 1911. The primary schools of the state have greatly increased since 1910, and the high schools increased from 83 in 1910 to 400 in 1920.

Institutions for higher and special education are Berea College, at Berea; Transylvania University, Lexington; Ogden College, Bowling Green; Central University of Kentucky, Danville; Wesleyan University, Winchester; and the University of Louisville, which was founded and is maintanied by the city of Louisville. All of the foregoing are for white students. For the education of the colored there are the Bowling Green Academy, Free Memorial Institute at Camp Nelson, the Danville Polytechnic Seminary, and the Wayman Institute, at Harrodsburg. There is a normal school for white students at Bowling Green and another at Richmond; and at Frankfort is a normal school for Negroes.

At the head of all the educational institutions is the University of Kentucky, a coeducational institution located at Lexington. The university was founded in 1865 as a part of Kentucky University. The latter is now known as Transylvania College. The university was reorganized in 1878 and was given the name of the Agricultural and Mechanical College. In 1922 there were 2,500 students enrolled, and the faculty numbered 150. The university comprises colleges of arts and sciences, law, civil engineering, agriculture, mines and metallurgy, mechanical and electrical engineering, and a graduate school. The institution derives its income from state and national appropriations.

GOVERNMENT. The present constitution of Kentucky, adopted in 1891, is the fourth the state has had. The procedure for amending the constitution is much the same as that followed in the other states.

The legislature consists of a senate of 38 members, elected for terms of four years, and a house of representatives of 100 members, elected for two years. Sessions are held every two years.

At the head of the executive department

is the governor, who is not eligible for reelection. The other executive officers are the lieutenant-governor, secretary of state, attorney-general, treasurer, auditor, registrar of land office, superintendent of public instruction, state fire marshal, and commissioners of agriculture, labor, statistics, and public roads. Each of the foregoing is elected for a term of four years.

The judiciary consists of a supreme court of not less than five nor more than seven justices, each elected for eight years, circuit courts, quarterly courts and county courts, the last two being presided over by the same judges.

HISTORY. Though the first settlement in Kentucky was not made until 1774—this at the place where the town of Harrodsburg now stands—a part of the present state was explored by Dr. Thomas Walker about twenty-four years before. Daniel Boone went into the state with his pioneering band in 1775 and founded Boonsborough. The Cherokees were induced to cede to the whites a piece of land some thousands of square miles in extent, and Richard Henderson, the man who had prevailed upon the Indians, organized in Kentucky the Transylvania Land Company. The present state of Kentucky was organized as a county of Virginia, and was later subdivided into three counties. Virgina refused for some years to hear the agitation for separation and organization as a separate state; but separation was allowed in 1790 and Kentucky entered the Union in 1792.

In the years that followed, Kentucky took a prominent part in the wars and in political agitation. After figuring in the War of 1812 and the Mexican War, in both of which its record was good, the state suffered during the Civil War. It attempted to remain neutral and was invaded by Union and Confederate forces. The Battle of Perryville, fought on Kentucky soil, kept the state in the Union. It escaped the military rule that obtained in other southern states, and at least partly for this reason has had a better post-bellum career than have some of its neighbors. See BOONE, DANIEL; CLAY, HENRY; BLUE GRASS; CIVIL WAR.

STATISTICS. The following are the latest reliable statistics available:

Land area, square miles	40,181
Water area, square miles	417
Forest area, acres	9,000,000
Population (1920)	2,416,630
White	2,180,560
Negro	235,938
Chief Cities:	
Louisville	234,891
Covington	57,121
Lexington	41,534
Newport	29,317
Paducah	24,738
Owensboro	17,424
Ashland	14,729
Henderson	12,169
Frankfort	9,805
Number of counties	120
Members of state senate	38
Members of house of representatives	100
Salary of governor	$6,500
Representatives in Congress	13
Assessed valuation of property	$2,248,356,058
Bonded indebtedness	$6,285,962
Farm area, acres	21,612,772
Improved land, acres	13,975,746
Tobacco, pounds	467,500,000
Corn, bushels	82,150,000
Wheat, bushels	6,340,000
Clover seed, bushels	34,000
Potatoes, bushels	3,770,000
Sweet potatoes, bushels	1,872,000
Hemp, pounds	2,600,000
Wool, pounds	3,115,000
Fruit, bushels	720,000
Domestic Animals:	
Horses	420,000
Mules	250,000
Milk cows	466,000
Other cattle	562,000
Sheep	1,137,000
Swine	1,429,000
Manufacturing establishments	3,957
Capital invested	$ 276,535,395
Operatives	69,340
Raw material used	$ 235,715,626
Output of manufactures	$ 395,660,417
Coal mined, tons	27,678,572
Petroleum, barrels (42 gals.)	8,692,600
Miles of railway	3,871
Techers in public schools	14,676
Pupils enrolled	558,843

Kentucky River, a river that rises in several forks in the Cumberland Mountains near the southwest border of Kentucky and flows sinuously northwestward for 260 miles, entering the Ohio at a point midway between Louisville, Kentucky, and Cincinnati, Ohio. The river flows through the most beautiful parts of the state and also through a region that is rich in iron,

coal, salt and marble. From its mouth to Frankfort the Kentucky has been dammed and canalized and is navigable for large steamers for this distance of 60 miles, and flatboats ascend 100 miles farther.

Kentucky and Virginia Resolutions, a series of resolutions deunciatory of the Alien and Sedition Laws, were adopted by the legislatures of Kentucky and Virginia in 1798 and 1799. They also contained a protest and a warning against the Federal government's assumption of powers belonging to the states. The Virginia resolutions, eight in number and probably written by James Madison, were passed in 1798. They were much less violent in tone than the Kentucky resolutions, written by Thomas Jefferson and passed in 1799. Copies of the resolutions were sent to the legislatures of other states; seven states sent replies, but all were comdemnatory.

Keokuk, Ia., the county seat of Lee County, is at the junction of the Des Moines and the Mississippi Rivers, 145 miles north of St. Louis, Mo. It is at the foot of the Des Moines Rapids of the Mississippi. In 1873, the government built a seven mile canal around these rapids, making possible continuous navigation between New Orleans, La. and St. Paul, Minn. But in the present century this canal was displaced by the Keokuk Power Dam and one of the largest hydro-electric plants in the world. The main part of the dam is 4,278 feet long, and the lock through which the river shipping passes is as wide as the locks at Panama. Power generated by the plant located here is transmitted to St. Louis, 145 miles distant, and to many other points in Missouri, Iowa, and Illinois. In the city, called the Power City, are lumber mills, garment, boot and shoe, and starch factories, a cement machinery factory, and many other factories and mills. It contains Rand Park, where Keokuk, the Indian chief for whom the city was named, is buried, a United States Weather Bureau station, a Federal building and good schools. Population, in 1920, 14,423.

Kepler, Johann (1571-1630), a German astronomer. A native of Würtemberg. He appears to have been educated at the expense of the reigning duke and to have been an apt mathematician and an ardent supporter of the Copernican system. In 1601 he was engaged as an assistant by Tycho Brahe at Prague, whom he shortly succeeded. Kepler inherited Tycho's observations and a series of records kept during many years. The details of Kepler's life are not pleasing. He was the son of an unhappy marriage in poverty. He himself married twice. His first wife was a woman of temper. His second wife he chose from eleven women whose characteristics he has left on record. His services fell in the troublous times of the Thirty Years' War, and Kepler himself died while waiting on the emperor, trying to collect a pittance of salary long overdue. In contrast with these unpleasing details are the importance of Kepler's laws:

1. Every planet moves in an ellipse which has the sun as one of its foci.
2. The radius vector of a planet moves over equal areas in equal times.
3. The squares of the periodic times of the planets are proportional to the cubes of their mean distances from the sun.

The first law may be understood by consulting the article on ELLIPSE. According to the second law, lines drawn from the sun to any two points in a planet's path a month apart inclose equal areas, which means that the line drawn from the sun to the planet shifts faster when the planet is in the part of its path nearer the sun.

According to the third law, a planet that is four times as far from the sun as another would require eight times as long to go around once, or at one-ninth of the distance it would require one-twenty-seventh as long to complete a revolution.

See ASTRONOMY.

Kerguelen (kĕrg'e-len) **Land, or Desolation Land,** an Antarctic island at the southern border of the Indian Ocean. It is about 100 miles in length and half as wide. It is composed chiefly of volcanic rocks, rising to a height of 2,500 feet. It has a barren, desolate appearance. Its cliffs and headlands are occupied by numerous sea fowl. There are no land animals. The vegetation is scanty. The island was

annexed by France in 1893. There are now a few settlers. The island is remarkable chiefly as the only known home of a cruciferous plant known as the Kerguelen cabbage. It is intermediate between lettuce and cabbage. tI grows abundantly. The heads abound in a yellow oil. When boiled and served at table, the so-called cabbage is a remedy for scurvy, the scourge of sailors. Before the art of canning made it possible to carry a supply of fresh vegetable food, ships in that part of the world made calls at Kerguelen Land to obtain a supply of the cabbage. See SCURVY.

Kerosene. See PETROLEUM.

Kewanee, Ill., a manufacturing city, 131 miles southwest of Chicago, on the Chicago, Burlington & Quincy Railroad. This city is the home of an extensive boiler and tube works employing 4,000 or more people. Kewanee boilers are well known wherever power is needed. Other manufactures are gasoline engines, steel coal chutes, pumps, agricultural implements, gloves, automatic sand-core machines, water supply systems, steam heating apparatus and private electric light plans. The city contains a Carnegie library, a Y. M. C. A., a Federal building, and a Masonic Temple, besides its schools. In 1920 the population was 16,026. Weathersfield was annexed in 1921.

Kew Gardens, a popular name for the royal botanical gardens and arboretum situated at Kew, on the left bank of the Thames, a few miles above London. This is one of the oldest botanical gardens in the world and is perhaps the most celebrated. It occupies the former private gardens and grounds of a royal residence. The gardens proper occupy about seventy-five acres, with 270 acres of wood, shrubbery, and lawn. An old royal deer park—a noble extent of lawn and fine trees—lies adjacent, making a total of about 650 acres. The grounds were planned largely by a Mr. William Aiton, a Scottish gardener, who enjoyed the friendship of Sir Joseph Banks, the great naturalist. The garden got its start from the collections brought to London by a number of navigators, not the least of whom was Captain Joseph Cook with whom Sir Joseph Banks sailed as a naturalist. A great number of new plants were classified and named by Banks and Aiton, the latter of whom in 1789 published a three-volume catalogue of the Kew Gardens, enumerating 5,600 plants.

A description of the gardens begins usually with the Palm House, an immense building, in the construction of which 45,000 square feet of glass and 19,000 feet of hot-water piping were used. Some sixty species of palms from a few inches to 100 feet in height are arranged with artistic effect, probably the finest single collection of palms in the world. The building contains also a great number of other tropical plants, as the cocoanut, the betel nut, the vegetable ivory, banana, plantain, the cinnamon tree, bamboo, banyan, fig, mahogany, pawpaw, cocoa, sensitive plant, sugar-cane, tamarind, coffee shrub, and other interesting plants too numerous to mention. The Temperate Buildings is given over to plants from the temperate climes of all the grand divisions. We cannot take space to describe the contents of the buildings in detail, but their names are suggestive, as Tropical House; Tropical Aquarium; Water Lily House; Hardy Medicinal Plants; Water Plants; Rock Garden; Economic House, given over to spices and all sorts of plants with economic value; Begonia House; Orchid Houses; Fern Houses; The Herbarium; and the Library. One of the most remarkable buildings is called Miss North's Gallery, in which several thousand paintings executed from nature by Miss Marianne North, and representing scenes in many quarters of the globe are on exhibition. The visitor is simply bewildered by wall after wall covered with exquisite water colors representing the most beautiful flowers.

The extensive grounds are laid out with taste in ferneries, rock gardens, hedges, walks, flower beds, little ponds, and, best of all, clusters of magnificent forest trees raised from the seed or from young saplings brought home in English ships, some of them centuries ago, from all quarters of the globe. The greatest pains have been taken to give each tree the shelter, soil, and care it demands. The giant redwood and sequoia of California are growing here. The Douglas fir of the Pacific coast has a place.

Trees which are common to Americans, but which would otherwise be unknown to the British, have been planted and tended with great care. American oaks, maples, hickories, ashes, poplars, magnolias, chestnuts, walnuts, Kentucky coffee trees, and the like, uphold the reputation of American forests. Our wild grape vines, the Virginia creeper, every curious and common plants, and hundreds of our wild flowers, including roses, lilies, honeysuckles, verbenas, nettles, callas, azaleas, rhododendrons, lilacs, and many others, are represented. The same is true of other countries. South American trees, plants, and flowers are there. The plants of the African desert and tropical forest have not been forgotten. Australia, India, China, and Japan have contributed. It would seem as though British naturalists had hunted every nook of the world where the British flag is known for specimens of forest, prairie, and aquatic plant life. There are a number of noted botanical gardens, but it is safe to say that one could acquire a better knowledge of the earth's vegetation in the forests, gardens, ponds, greenhouses, hothouses, and herbaria of Kew than at any other one place. The gardens are maintained at the expense of the government and are open to the public.

See BOTANICAL GARDEN; SHAW'S GARDENS; JAVA; BOTANY.

Key, Ellen Karolina (1848 - 1926), Swedish social and ethical writer. She was born in Smäland, southern Sweden. The family name is of Scotch origin and for many generations was written McKey. Her father was Emil Key and her mother was of royal blood. As a young woman Miss Key taught in a private school and lectured at the People's Institute, Stockholm, and elsewhere, and contributed to leading European journals and publications. She possessed a keen, analytical mind, and was regarded as unconventional in her views. Her writings on the woman movement and on the education of children at first brought her much criticism from orthodox quarters. Although a fearless and somewhat reckless protagonist of pioneer views, she lived to see whatever of condemnation there had been of herself and her theories turn into understanding, appreciation and honor. Such leaders as Georg Brandes, Maurice Maeterlinck, George Bernard Shaw, Havelock Ellis, and many others thought highly of her work. The Swedish government offered her the land upon which her villa stood and she was able to build upon it from the receipts from her books, which have been translated into many languages and sold all over the world. Among them are: *The Century of the Child; The Morality of Woman; The Misuse of Woman's Power; Love and Ethics; The Woman Movement; The Renaissance of Motherhood; The Younger Generation* and *Life Lines.*

Key, Francis Scott (1779-1843), The author of "The Star Spangled Banner." He was born in Frederick County, Maryland, and died at Baltimore He was educated at St. John's College, Annapolis. During the British bombardment of Fort McHenry in 1814 he was detained on board the British fleet. He watched the bombardment all through the evening, and listened to the sound of cannon all night. He took from his pocket an old envelope and opening it with a penknife wrote the immortal song upon that crude stationery. This was at once printed and became almost instantly popular. It was sung to the tune "Anacreon in Heaven."

It is of interest to know that the "broad stripes and bright stars" were fifteen in number. At this date the national flag had fifteen stripes, thirteen for the original states and one each for Vermont and Kentucky. The flag was forty feet long and thirty feet wide. The stripes were two feet wide and the stars were two feet from point to point. See FLAG.

Key West, an island and city of southern Florida. The word "key," spelled also "cay" and "kay," is Spanish for "low island" or sandbank. It is related possibly to the English word, quay, meaning a wharf. Like the other Florida keys, Key West consists of a scanty layer of soil resting on a foundation of coral. The island lies nowhere to exceed twelve feet above the sea. The soil is fertile and the vegetation is luxuriant. Key West is the outermost of a long curve of islands that has been described aptly as a finger pointing toward Cuba.

The city of Key West is about 100 miles distant from Havana. It possesses a fine harbor. It is a United States naval station, and possesses a number of government buildings. It has regular communication by steamer with Cuba and the cities of the United States, both on the Atlantic and Gulf coasts. The industries of the city are characteristic. It is a center of the sponge fishery. It is noted for the manufacture of cigars and ornaments made from turtle shells. Fishermen bring ashore enormous green turtles.

On January 12, 1912, the over-sea railroad to Key West, 156 miles in length, was opened. For many miles the right of way lies over salt water and at certain points passengers are out of sight of land. The railroad extends from key to key by means of piling and bridges. It was thought at one time that the project would have to be abandoned. Henry M. Flagler, at the head of the enterprise, spent many millions of dollars, much of which was wasted, because of storms that swept away the low lying railroad on the keys of the ocean.

Havana is now only 48 hours from New York and Key West has become another American seaport whose importance is increasing from year to year. The population in 1920 was 18,749.

See CUBA; SPONGE; FLORIDA; PINEAPPLE.

Khaki, kä′kē, a kind of light brown cotton cloth brought into public notice by its use for the uniforms of the British army in India. It is a dust colored sort of duck of great strength and durability, well adapted to the use of soldiers, especially in hot countries. It was worn by the British soldiers in the late South African War with the Boers. It was adopted by the United States army for use in the Spanish-American War and is now worn by the American soldier. Our government buys 5,000,000 yards of eight-ounce khaki a year for this purpose.

Kharkov, the capital of the Russian province of Kharkov and one of the chief towns of the Ukraine, is 465 miles south by west of Moscow. It is the seat of a university, which has about 1,000 students. This university was founded in 1803. Attached to it are an observatory, a large library of about 173,000 volumes, a botanical garden and an anatomical museum. There are also a technological institute, a theological academy, a medical school and a number of special schools. Owing to its central position, Kharkov is one of the important commercial centers of Russia. The city has large factories, distilleries, sugar refineries, candle works, soap works and iron foundries. Kharkov's imports come chiefly by way of the Baltic, and consist largely of tobacco, tea, wine and machinery. The city was founded in the middle of the sixteenth century. Population at last census, 285,630.

Khartum, a town in eastern Soudan, is on the left bank of the Blue Nile, near its junction with the White Nile, situated in a sterile, treeless region. The present town was laid out by General Kitchener in 1908. The government buildings are European in style. The town has a hospital and barracks, several churches, a mosque and is the seat of a bishop. The palace of the governor-general and the Gordon Memorial College are fine, modern buildings.

Khartum is the center of trade in the Sudan, and imports powder, grain, textiles, etc., while its exports consist chiefly of ivory, ostrich feathers and fruit.

The town was founded in 1822 by Mehemet Ali, and in 1830 it became the seat of the Governor-General of Sudan. In 1885 it was taken by the Mahdi, after the valiant defense of General Gordon, who was killed in the massacre following the capture. The Cape-to-Cairo Railway was extended southward to this point soon after that enterprise was projected. At Khartum North, a Central Research Farm for the furtherance of agricultural research and education is carried on under the Department of Agriculture. Population 23,083.

Khedive, the official title of the Governor of Egypt, conferred upon Ismail I by the Sultan on May 14, 1867. The present ruler (1923) Ahmed Fuad Pasha, son of Ismail Pasha Fuad assumed the title of king when Great Britain acknowledged the independence of Egypt. He is the eighth ruler of the dynasty of Muhammad Ali, appointed Governor of Egypt in

1805, and who, in 1811, made himself absolute master of the country by force of arms. See EGYPT.

Khyber (kī'bẽr) **Pass,** a narrow mountain pass in eastern Afghanistan. Geograpically, as well as historically, it is the most remarkable pass in the world. It is about thirty-three miles in length. A mountain torrent issues at each end. At the narrowest place, the pass is only ten feet in width. Rocks tower up on each side, at one point to a height of 1,300 feet. In addition to its natural strength, the pass is commanded by Afghan fortresses. It has been taken by the British several times. The highest point of the pass is 3,373 feet above sea level. It is the only practicable route for travelers, caravans, or armies between India and Afghanistan. The pass is a two days' march north of Peshawar, the terminus of the British Indian railway system. Some authors believe that the army of Alexander the Great traversed the pass.

Kidd, William, (1654-1701), was born at Greenock, Scotland and was hanged in London as a pirate. Evidence came to light in 1926 to show that his "trial" and execution were unjust. At forty-three Kidd was known everywhere as a man of great honor and ability, as well as a loyal and devoted husband and father. In 1696 he received a commission addressed to "our trusty and beloved Captain Kidd" to suppress the prevalent piracy on the seas. The only crew available for such work was drawn from the riff-raff of the New York and London waterfronts. He captured several prizes, quite legally for those days, and once killed the ringleader of a mutiny. He never raised "the black flag" or made anybody "walk the plank." His arrest and "trial" were engineered by the political enemies of those from whom he had his commission, and papers which would have exonerated him were not allowed as evidence.

Kief, Kieff, or Kiev, kē-ĕf', a city of southern Russia. It is situated on the Dnieper, almost due south of St. Petersburg, two-thirds of the distance to Odessa. It is called the "Mother City of Russia." Kief is older than Moscow. It was in the waters of the Dnieper, at Kief, that St. Vladimir, the first Russian saint, baptized his converts. Kief was the seat of the first Christian church, the first Christian school, and the first library in Russia. For 376 years it was a free commercial city; for eighty years it was in the hands of the Tartars; for forty-nine years it belonged to the Lithuanians; the Poles held it for ninety-eight years. In 1667 at the partition of Poland, it was reincorporated in the Russian empire. A church of St. Sophia is built on the plan of St. Sophia at Constantinople, but of one-fourth the size. A monastery near by guards caves or catacombs in which over a hundred saints lie entombed. It is a place of great sanctity, and is visited annually by a third of a million Russian pilgrims, adherents of the Greek Church. "On the night of August 15, 1872, 7,200 pilgrims were counted lying under the open sky." The commercial prosperity of the city has been promoted by the holding of great fairs. The present population is 610,190. Kief is in size the sixth city in Russia. There is a university with 3,000 students — one of the hotbeds of revolutionary ideas.

Kiel, kēl, a city of northwestern Prussia. It is situated in the province of Holstein on a deep bay of the Baltic. The bay has the appearance of a lake with finely wooded shores. Kiel was a city of administrative importance in the duchy of Schleswig-Holstein, and was annexed with those states to Prussia in 1864. The University of Kiel was founded in 1665. There are about 2,000 students in attendance. The institution possesses a large library, a zoölogical garden, and various museums of antiquities. Kiel has an excellent harbor, and is advantageously situated for trade between land and sea. Population, 205,330.

Kiel Canal, the popular name of an important German waterway officially named the Kaiser Wilhelm Canal. It cuts across the peninsula of Schleswig-Holstein, connecting the Baltic and the North seas, and makes unnecessary the former 200 mile trip around Denmark and the end of the peninsula. The canal was begun in 1887 and was completed in 1895; it was 190 feet wide at the surface and 29.5 feet deep. The rapid increase in shipping and

greater dimensions of vessels built after 1895 made a much larger canal necessary. Consequently, work on enlargement began in 1908, and in June, 1914, six weeks before the outbreak of the World War, the canal was again opened. It is now 140 feet wide at the bottom, 330 at the surface, and is 36 feet deep. The eastern end of the canal is at Schonberg, near the German naval base, Kiel; the western end opens into the Elbe River at Brunsbüttel.

Kilauea, an active volcano in Hawaii. Its crater is about 9 miles in circumference, with a lake of red and boiling lava at the bottom, over 1,000 feet below the crater's mouth. The great eruptions from this crater were those of 1789, 1823, 1832, 1840 and 1868. Kilauea-iki (Little Kilauea) is a companion crater, now extinct, of the same type, and affords excellent opportunity for the study of volcanoes of the Kilauea type. See VOLCANO.

Kilkenny the seat of an Irish county of that name. By land, it is midway from Cork to Dublin. Its port is Waterford on the southern coast. It is in the center of a district productive of grain and livestock. It was from an early date a place of political importance, being one of the first positions seized by the English invaders. Some towers of a castle built by Strongbow in the twelfth century are still standing. Several Irish Parliaments were called here. In 1367 the well known statute of Kilkenny was enacted. The British conquerors were determined to prevent fusion of the English and the Irish. The statute forbade a person of the English blood to learn the Irish language, to take an Irish name, or to wear Irish dress. It was made an act of treason for one of English blood to marry a person of Irish blood. There are several buildings of local note, including cathedrals, both Protestant and Catholic. The city was at one time the seat of important woolen manufactures. The present population is about 12,000. The city has frequent mention in literature and history. The natives have the usual reputation for fighting. A well known legend of the Kilkenny cats runs to the effect that

There wanst was two cats at Kilkenny,
Each thought there was one cat too many;
So they quarrelled and fit.
They scratched and they bit,
Till, excepting their nails
And the tips of their tails,
Instead of two cats there weren't any!

See IRELAND.

Killarney, a market town in the county of Kerry, Ireland. It lies on the route of travel between Cork and England. The famous lakes of Killarney, a series of three connected bodies of water, are in the immediate vicinity. They are surrounded by the mountains of Kerry and are widely celebrated. "The beauty of the scenery consists in the gracefulness of the mountain outlines, the rich and varied coloring of the wooded shores deepening through gray rock and light green arbutus to brown mountain heath and dark firs." The town has a permanent population of about 5,500. Many thousand visitors come every summer to make the tour of the lakes. The ruins of the ancient abbey of Muckross and other antiquities lend charm to one of the most delightful trips in the United Kingdom.

Kilpatrick, Hugh Judson (1836-81), an American military officer, and brilliant cavalry leader on the Union side in the Civil War, was born near Deckertown, N. J., and graduated from West Point in 1861. In the same year he entered the Federal service as captain in the Fifth New York Volunteers, popularly known as Durea's Zouaves. From 1862 to 1864 he played an important part in nearly all the cavalry operations in the campaigns of the Army of Virginia and the Army of the Potomac, and made successful raids and gathered important information as to movements of the Confederate army. He was signally gallant in the second battle of Bull Run. He was appointed a brigadier-general of volunteers in May, 1863. In the last months of 1864 he commanded the cavalry of Sherman's army in its march from Atlanta to Savannah. At the close of the war he was made major-general for his services during the campaign in the Carolinas, and in 1865 attained the regular rank of major-general of volunteers. He resigned from the regular army in 1865, and from the volunteer service in 1866, and entered the diplomatic service of the United States.

Kimberley, a city of southern Africa. It is situated near the western boundary of the Orange River colony, 650 miles by rail north of Cape Town. Present population, about 40,000. It owes its reputation to the vicinity of several diamond mines, the most important known. The diamond excitement began here in 1870. Diamonds to the value of not less than $325,000,000 have been obtained here. See DIAMOND; BOERS.

Kindergarten, literally, a child garden. A school for young children. The fundamental idea is education through toys, known as gifts, busy work, plays, games, and songs. The kindergarten age is from four to six,—before most children are mature enough to undertake ordinary school work with profit. A cheerful room is required. The pupils are provided with small chairs. These they place at the two sides of a long, low table for busy work, such as cutting, folding, pasting, weaving, sewing, clay work, brush work in color, straw work, mounting leaves, stringing berries, and many other occupations. Wooden splints and slats, pasteboard circles and triangles and squares, rings, cubes, spheres, and building blocks are provided as well. The main part of the room is occupied usually by a large painted ring, around which the children arrange their chairs cosily for games, songs, story telling, and the like.

The kindergarten system is an outgrowth of a German movement led by Pestalozzi for a kindlier atmosphere in the schoolroom. It is a reaction against the harsh, unsympathetic, callous, not to say tyrannical and even brutal teaching too prevalent the world over a century ago. The immediate founder of kindergartens was Friedrich Froebel, a German educator. In 1837 he established a school of this sort in Blankenburg, Thuringia.

Henry Barnard, who had just returned from the London Exposition of 1854, was the first American to call public attention to the kindergarten. On his appointment later as United States commissioner of education, he returned to the subject. The first American kindergartens were established in a quiet way by Germans at Columbus in 1858, Hoboken in 1861, and New York in 1864. Elizabeth Peabody, of Massachusetts, is regarded as a pioneer advocate of the kindergarten in America. She not only encouraged the founding of numerous private and charity kindergartens and the first public kindergarten, but she founded the American Froebel Union and for years sustained a kindergarten magazine.

Boston opened the first public American kindergarten in 1870. St. Louis was the first city to establish kindergartens on a large scale. The St. Louis system began in 1873. It now includes about 125 kindergartens. Boston employs a supervisor for this work. Kindergartens are now recognized widely as a legitimate part of public school work. A kindergarten is considered a necessary feature of a normal school. The Winona Normal of Minnesota shares with Wisconsin the honor of establishing a model kindergarten in 1880.

Some of the more noted private kindergartens are those maintained in connection with the training departments of Pratt Institute, New York, the Teachers' College of Columbia University, and the College of Education of Chicago University. Charity kindergartens are maintained by many city churches and organizations. It is estimated that about 300,000 children attend American kindergartens, public, private, and charity schools included.

King, William Frederick (1854-1916), a Canadian surveyor and astronomer, was born at Stowmarket, Suffolk, England. He went to Canada with his parents at an early age and was educated at the University of Toronto. After being employed for some time on Dominion land surveys in the Northwest, he entered government service as an inspector of surveys and became chief inspector in 1886. Later he was appointed chief astronomer of the Department of the Interior, holding this position until 1905, when he became director of the Dominion Astronomical Observatory, Ottawa, and later superintendent of the Geodetic Survey of Canada. Mr. King was appointed Royal Commissioner for the international boundary between the United States and Canada under the treaties relating thereto and in 1904-1907 was a member of the International Waterways Commission. In 1906

he was made honorary president of the Royal Astronomical Society of Canada and in 1911 was president of the Royal Society of Canada. He was made a C. M. G. in 1908. Mr. King is the author of *Astronomy in Canada* and other scientific papers.

King, William Lyon Mackenzie (1874-), the Premier of Canada, was born at Kitchener, Ontario, and attended the University of Toronto. Following his graduation at Toronto, Mr. King took postgraduate work in the University of Chicago and later became a fellow in political science at Harvard, where he remained from 1897 to 1900. In 1898 he was awarded the degree of A. M., and the degree of Ph. D. in 1909. At the age of twenty-five he was offered a professorship in Harvard, but declined the offer, to engage in public life in his own country at a much lower salary.

Mr. King educated himself for public work and became Minister of Labor and editor of the *Labor Gazette* in 1908. During this time he served as chairman of several royal commissions on labor and immigration problems and as government conciliator in numerous industrial disputes. He represented the Canadian Government in negotiations with the British Government on immigration into Canada from Britain. In 1908 he held a similar position on a Commission treating immigration into Canada from the Orient. He was one of the British delegates on the International Opium Commission at Shanghai in 1909. He was made Fellow of the Royal Society in Canada in 1910 and was Minister of Labor in the Laurier Cabinet from 1909-1911. From 1914 to 1917 he was president of the General Reform Association of Ontario. During the war, Mr. King rendered remarkable executive service in furthering a continuous maximum production in war supplies by preserving harmonious relations between workmen and employers in several of the most extended of the war industries of America. He was a member of the National Executive Committee on the patriotic fund from 1914 to 1920. He was elected leader of the Liberal party to succeed the late Sir Wilfred Laurier, at the National Convention in 1919. In 1921 he was elected Premier in one of the most sweeping Liberal victories the Canadians have ever known.

Mr. King was one of the foremost advocates of reciprocity with the United States. In the election in 1911 this position of the Liberal party led to their defeat. The party which has again come into power is pledged to a revision of the Canadian tariff downward, a revision which doubtless will be in the interest of both Canada and the United States.

Mr. King is the author of *Legislation on Industrial Disputes in Canada, Industry and Humanity, Technical Education*, and several other works, besides being a frequent contributor to several leading periodicals.

King, William Rufus (1786-1853), an American statesman, was born in Sampson County, North Carolina and graduated from the University of North Carolina. He studied law and was admitted to the bar in 1806, and in the same year was elected to the State Legislature, afterwards, 1810, to the Federal House of Representatives. He resigned from this position in 1816. King was a member of the convention which drew up the constitution for the proposed state of Alabama in that year, and after its admission in 1819 took his seat in the United States Senate as one of the first Senators from Alabama. In 1852, King was elected Vice President of the United States on the Pierce ticket, but died before he could serve.

King Lear, one of Shakespeare's great tragedies. It was written in 1605 and was published in 1608. The story of Lear and his three daughters is an old one. It is found in the *Gesta Romanorum* and in the *Holinshed Chronicle.* Layamon told it in *Brut,* Geoffrey of Monmouth gives a version of it in *Historia Regum Britanniae,* and Spenser tells it in the *Faerie Queene.* There is also an old ballad of *King Leir and His Three Daughters,* although this may have been written after Shakespeare's play appeared. An old play of *King Leir,* which had been acted many times, last in 1594, was published shortly before Shakespeare's *Lear.* This play is not a tragedy, the story having a happy ending. Shakespeare's *King Lear* is tragedy in the most sublime,

the most awful sense of the word. The injustice of a father to a noble daughter, the ingratitude of selfish daughters toward an indulgent and affectionate father, the tenderest of human affections thus outraged—this is Shakespeare's theme—which he has so handled that "in every act the pity and terror of which tragedy is capable reach the climax." As Rolfe says, "To presume to comment upon *Lear* seems little short of profanity."

Two characters in the play have given rise to much discussion. King Lear himself—"the very foolish, fond old man, fourscore and upward," is regarded by certain critics as insane from the beginning of the play. Others claim that he is insane only after the ill-treatment received at the hands of his daughters. It is an interesting fact that several physicians, experts in insanity, have written essays to prove the insanity of Lear from the opening scene. Their opinions may be received with all respect without being accepted as a proof that Shakespeare intended to represent Lear as insane. Shakespeare may have pictured a personality truthfully without himself understanding the cause of the peculiarities that characterize it.

Another subject much discussed is the character of Cordelia. Cordelia is true, pure, brave, womanly; yet all her own troubles and her father's woes are a result of her refusal to give expression to the filial affection which no one can doubt she feels. Is she of so reticent a nature that it is impossible, as she herself says, for her to "heave her heart into her mouth?" Or is she simply obstinate and selfwilled? Cordelia cannot foresee the result of her act. She does see that she is wounding her father when she maintains that she loves him only as is due from child to father, "no more, no less." She knows, however, as no one else knows, the hard and selfish nature of her sisters, and the expressions of affection which she would have given readily enough to her father had she been alone with him, she cannot bring herself to utter after the insincere exaggeration of these heartless and grasping women. Any honest asseveration of love would have fallen flat after their hypocrisy.

King Philip (?-1676), a famous Indian chief and one of the outstanding Indian figures of early colonial days in America. He was the son of Massasoit, and was named Philip by the English, his Indian name being Metacomet. Philip was chief of the Wampanoags, who settled in Rhode Island in 1662. He went to Plymouth, promising his friendship to the English, but in 1670 he fell under suspicion, due largely to the number of murders committed in his country. Philip met the English and again professed good will, but his braves were arming for war. Killing and retaliation followed, culminating in 1675 in open hostilities. The Indians killed and burned in parts of Massachusetts and Rhode Island, and in turn were killed in large numbers by the English. Gradually the Indians succumbed to the superior numbers of their opponents. Philip was finally tracked to a swamp, and there killed. During the fighting the English lost about 600 men and a number of buildings, while the losses in killed were much greater on the Indian side. The Wampanoags were overthrown.

Kingbird, a large species belonging to the flycatcher family. The kingbird is so called from the zeal with which he drives crows and hawks from the vicinity of his nest. Also called bee-bird, from an inveterate habit of stationing himself, flycatcher fashion, on a perch near beehives, from which he darts off and back again, snapping up a bee at each trip. Kingbirds are welcomed by poultry raisers and are dreaded by bee keepers. The kingbird is a slate-colored bird; underparts white; tail black, tipped with white. The head is crested with a concealed orange-red spot that no one would suspect. Nests are built at ends of branches ten to twenty-five feet up. In prairie countries the bird is apt to build on fence-corners. Eggs, three to five, white, spotted with amber.

The kingbird is found throughout North America in the summer, especially in the East as far north as New Brunswick, though it is met with more rarely west of the Rockies. In the autumn it migrates to Central and South America, where it

stays during the winter, coming north again early in May.

There are many varieties of this bird, and it is known by different names in different parts of the United States. The gray kingbird is found in Florida and the West Indies, and Cassin's kingbird is met with in the Rocky Mountain region. The song of the kingbird is not particularly musical, but it is cheery and attractive.

Kingfisher, a family of birds represented in temperate North America by the belted kingfisher. One hundred eighty species are

Kingbird.

known in the Malay Archipelago, some of them being forest birds living on insects and snails. Our North American bird is, however, typical of the family. It lives a solitary life, sitting on an overhanging dead limb on the wooded shore of a stream or pond, apparently studying its own portrait in the water, but in reality watching for dinner. It is thirteen inches in length. Its upperparts are bluish gray, wings tipped with white and underparts chiefly white. The epithet "belted" is derived from a band of blue across the breast. The head bears a prominent crest. The nest is placed at the end of a six-foot burrow dug with foot and bill in a sandy bank. Five to eight white eggs are hidden in the burrow, which also serves as a nightly shelter for the family early in the season. As soon as the young are old enough the family breaks up, each individual fishing its own portion of shore. The kingfisher's chief food is minnows, which it catches crosswise in its bill by plunging into the water either from the wing or from an overhanging perch. If disturbed it flies with a loud rattling scream to a perch further along the shore. If followed this operation may be repeated until the further limit of its district is reached, when it flies back by a wide detour to the other end of its range.

William J. Long, in his *Wilderness Ways,* records some interesting observations of this quaint old fisherman and his cranky methods. According to Mr. Long it warns game of the approach of a hunter and spoils many a coveted shot at moose, bear, or deer. The poet Lowell, who was a close student of birds, says, "Kingfishers have sometimes puzzled me . . . perched at high noon in a pine, springing their watchman's rattle when they flitted away from my curiosity, and seeming to shove their top-heavy heads along as a man does a wheelborrow."

The jackass kingfisher, or laughing kingfisher, is a large brown species, seventeen inches long. It takes its name from a harsh braying jackass-like cry. It is at home in the dry plains of Australia, and nests in the sand. It does not frequent water, and is not a fisherman. It lives on insects, lizards, small snakes, etc. See HALCYON.

King's Evil. See SCROFULA.

Kingsford, William (1819-1898), a Canadian historian and engineer, was born in the Parish of St. Lawrence Jewry, London. He was sent to school at Camberwell, where he studied architecture; but at 16 he enlisted in the army, going with his regiment to Canada in 1837. Leaving the army in 1841, Kingsford secured a position in the surveyor's office of the city of Montreal. In 1846-48 he was employed on the survey for the Lachine Canal; in 1849 he went to the United States to assist in the construction of the Hudson River Tunnel; and later helped to build a railroad in Panama. Returning to Canada, Kingsford was engaged successively on the Grand Trunk Railroad, and the Rideau

Canal. He was Dominion engineer in charge of the St. Lawrence River and Great Lakes harbors. Among his historical works are an exhaustive and accurate *History of Canada, Canadian Archaeology* and *The Canadian Canals.*

Kingsley, kĭngz'lĭ, **Charles** (1819-1875), an English clergyman and writer. He was born near Dartmouth, Devonshire. He was educated at Cambridge for the church. In 1844 he became rector of Eversley, which living he held until his death. He occupied a chair of history at Cambridge for some years. In 1873 he was appointed Canon of Westminster. He took an active interest in social conditions, especially in bettering the material position of the working people. *Alton Locke* and *Yeast, a Problem* deal with the Chartist movement and labor problems. *Hypatia* is a tale of old Alexandria. *Westward Ho* is a stirring story of Sir Walter Raleigh's day. *Hereward the Wake* is the favorite of boys. *The Water Babies* is a scientific fairy tale.

QUOTATIONS.

Men must work and women must weep.

Do noble things, not dream them.

The sunshine follows the rain.

SAID OF KINGSLEY.

One of the good influences of the age.—Mill.

Kingsley had a true interest in things as they are and ought to be.—Henley.

Kingston, a city in Canada, the capital of Frontenac County. It is on the mouth of the Cataraqui River, near the junction of the St. Lawrence and Lake Ontario, 163 miles east of Toronto. Prominent among the manufactures of the city are locomotives, cotton, leather, pianos, flour, and cereals. It is an important shipping center because of its favorable location, and its harbor is large and easily accessible. The educational institutions of the city are Queen's University, Kingston School of Mines, Kingston Business College, Royal Military College, Dairy School, Collegiate Institute and Regiopolis College. Queen's University was chartered in 1841. It is controlled by the Presbyterian church, and in 1903 the enrollment was about one thousand. Kingston has many noteworthy buildings in addition to those of the university, such as the Catholic cathedrals and the General Hospital, the Hotel Dieu Hospital, and the Rockwood Hospital for the Insane. Kingston was settled by the French in 1672 and was incoorporated as a city in 1838. The population in 1921 was 21,753.

Kingston, N. Y., the county seat of Ulster County, is beautifully situated on the Hudson River, 55 miles south of Albany. It is the gateway to numerous Catskill Mountain resorts. It is on several railroads and is a stopping point for the river steamers. This city was founded by the Dutch in 1652, and was named by them Esopus. In 1661, a village charter was granted the settlement by Governor Stuyvesant, who named it Wiltwyck. In 1667 the English took possession of it, and in 1669 changed its name to Kingston. The first state convention of New York convened here in 1777, and the first state constitution was proclaimed in front of the courthouse in April of the same year. On Sept. 9, 1777, the first state court was opened here by Chief Justice Jay. In October, 1777, almost the entire town was burned by British troops under General Vaughn. Kingston manufactures include boats, cement, shirts, hardware, bricks, lace and machinery It contains a high school, business colleges, a library, a Y. M. C. A., an industrial home for orphans, a home for the aged, public and private hospitals and several fine hotels. Population in 1920, 26,688.

Kipling, Rudyard, an eminent man of letters. He was born at Bombay, India, December 30, 1865. Both his mother and his father were the children of Wesleyan preachers, of Yorkshire stock. John Lockwood Kipling, his father, was educated in the Staffordshire potteries and in the studio of a sculptor. He went to Bombay as a professor of architectural sculpture in a British school of art established there. Rudyard was named for the village of Rudyard, on a pretty English lake in Staffordshire, where his father and mother first met. His first remembrance is of Bombay and its cosmopolitan life. In 1871 he was put in school in England. His experience was

not particularly happy. He was visited by his parents only occasionally. In 1882 he returned to India and secured a position on the Lahore *Civil and Military Gazette,* one of the most influential papers in India.

Young Rudyard inherited literary ability and likings from both father and mother. As in the case of Dickens, Field, and many another successful writer, his training was that of a newspaper office. He wrote a number of tales and poems for the columns of the *Gazette.* His first published book, 1886, was a volume of poems, *Departmental Ditties.* A writer in the London *Academy* said: "The book gives promise of a new literary star rising in the East." *Soldiers Three,* stories of barrack-room life; *The Story of the Gadsbys,* a tale without a plot; *In Black and White,* stories of native life; *Under the Deodars; In Social Byways; The Phantom Rickshaw,* and other eerie tales; *Wee Willie Winkie,* and other child stories; *The City of the Dreadful Night;* and *Letters of Marque,* first appeared in the Indian Railway Library of A. H. Wheeler and Company, price, one rupee. They were written in rapid succession, and brought the author a sufficient income to make him independent.

In 1889 Kipling left India. He has traveled widely. He is familiar with southern Asia. He has visited America, China, Japan, and Australia. During the Boer War he went to Africa. In 1892, he married Miss Caroline Balestier, an American girl, the sister of a literary friend. The subsequent four years were spent in a home among the Green Mountains at Brattleboro, Vermont. The Kipling home is now at Rottingdean, on the southern coast of England. In recent years Kipling seems to have lost both his early optimism and virility. He scolds more than he inspires. He has lost confidence in his native country and seems to be trying to make his countrymen suspicious and to fill them with hatred towards their neighbors.

Kipling is a voluminous writer. The Outward Bound edition of his works has reached twenty-four volumes, with more to follow. The titles are:

Plain Tales from the Hills.
Soldiers Three and Military Tales, two volumes.
History of England.
Songs from Books.
The Harbour Watch.
The New Armies in Training.
France at War.
Fringes of the Fleet.
Sea Warfare.
Diversity of Creatures.
The Naulahka.
Captains Courageous.
The Day's Work, two volumes.
From Sea to Sea, two volumes.
Stalky & Co.
Kim.
The Five Nations.
Traffics and Discoveries.
Puck of Pook's Hill.
Actions and Reactions.

Kipling knows the value of individual words as a mechanic knows the use and importance of different tools, and can turn with perfect ease from the sledge hammer to the awl or file.—F. L. Knowles.

He is of all living writers the most careful and conscientious in the matter of form.—Spectator.

Kit-Cat Club, a convivial association of London wits, painters, politicians, and men of letters. The club was founded during the reign of James II. It was Whig in politics. The source of the name is in dispute. The club met in the dining room of the house of a pastry cook named Christopher Cat, a famous maker of pies. Some derive the name of the club from the name of the keeper of the house, Kit being an abbreviation for Christopher. The ninth number of the *Spectator* says that his pies were known as kit-cats, whence the name of the club. Still another theory accounts for the name of the club by saying that its meetings were held in an inn called the Cat and Fiddle, kept by a person of the name of Christopher. There were thirty-nine members. The names best known to history are Marlborough, Halifax, Walpole, Congreve, Steele, and Addison. A number of portraits painted by Sir Godfrey Kneller, an important member of the club, have been preserved. The last meeting of the club was held in 1720. See CLUB.

Kitchen Cabinet, in American politics, a term of derision appied to certain intimate political friends of President Andrew

Jackson. They were: Amos Kendall of Kentucky, political manager and "moving spring of the administration"; Isaac Hill, editor of the *New Hampshire Patriot;* Mayor William B. Lewis of Nashville, second auditor of the treasury; and General Duff Green, the editor of the administration organ at Washington, the *United States Telegraph.* These men are reputed to have had greater influence than the members of President Jackson's official cabinet.

Kitchen Midden, a mound of shells, bones, charcoal, and other debris found on the site of ancient dwellings. The word means kitchen refuse. It was applied first by the Danes to enormous deposits of that sort which attracted attention first in Denmark. Kitchen-middens occur usually on the shores of rivers or banks of lakes where savages pitched their tents or other rude habitations for possibly thousands of years. They abound not only in Denmark, but in Scotland, England, France, and in many parts of North America, as about the great lakes and along the Mississippi. The accumulations are often many feet in depth, sometimes, in fact, forming embankments. Archaeologists find stone implements and other rude utensils, hinting at the life of prehistoric people. Very similar deposits are still accumulating in various parts of the world where savage people dwell. The dumping grounds that disfigure river banks everywhere are the kitchen middens of people calling themselves civilized.

Kitchener, Horatio Herbert, Lord (1850-1916), a British general. He was born in County Kerry, Ireland, and educated at the Royal Military Academy at Woolwich. In 1871 he became a lieutenant in the Royal Engineers. In 1874 he was engaged in a survey of Palestine, and four years later in a survey of Cyprus. He was sent to Egypt in 1882 as a major of cavalry, and two years later formed part of the Nile expedition to relieve "Chinese" Gordon. From that time on his career in Egypt is a record of promotions for distinguished service. On his return to England in 1898 he was made Baron Kitchener of Khartum, and was voted the thanks of Parliament with a grant of £30,000. At his suggestion a university was founded at Khartum, the funds necessary being raised by public subscription. The following year he was made governor-general of the Sudan, and later chief of staff to Lord Roberts, the commander-in-chief of the English forces during the Boer War. There his work was most exciting; at one time he barely escaped capture by the Boers. Upon the return of Lord Roberts to England in December, 1900, Lord Kitchener was made commander-in-chief. Through his efforts the war was brought to a peaceful conclusion in May, 1902, and Kitchener was raised to the rank of viscount. Shortly after he was given chief command of the army in India. At the outbreak of the European War of 1914, Kitchener, who has been characterized as "the most effective soldier of his age," was most appropriately made secretary of state for war and began extensive preparations for the great conflict.

His service to Great Britain was great. He predicted that the war would last three years and planned accordingly. He formed an army of millions when others said it could not be done. He was killed while on his way to Russia when the cruiser Hampshire was torpedoed.

Kitchener (formerly Berlin), Ontario, the county town of Waterloo County, is near Grand River, 60 miles west of Toronto and 35 miles west of Hamilton. It has interurban connection with Galt and other towns, and is also served by the Canadian National railroads. The surrounding country is rich in agricultural land, while the city itself is an industral center. Its many factories produce gasoline engines, wood-working machinery, rubber footwear, automobile tires, shirts, collars, phonographs, vacuum cleaners, baby carriages, boots, shoes, trunks, leather, clocks, ladders, bicycles and other articles. Kitchener is a well-paved and lighted city, with an educational system comprising seven public schools, Saint Jerome's College (Roman Catholic), a technical school and a collegiate institute. There is a large park, and the city owns and operates all public utilities. In 1921 Kitchener had a population of 21,763.

Kite, a bird of the hawk kind. The kite is smaller, less powerful, and less fierce than the hawk. The swallow-tailed kite, of Eastern North America, is very attract-

ive in appearance. It is graceful, with a long two-pointed tail. The under parts are white and the upper parts a bluish black. It nests in tall trees. It snatches up a fish from the surface of the water without alighting and eats it while on the wing. A white-tailed kite breeds from Oklahoma southward. The Mississippi kite breeds from Illinois southward. The Everglades kite lives in Florida. All kites spend the winter in the tropics. See HAWK.

Kite, a common aerial toy, a light flying machine. The kite consists usually of a light frame of wood covered with paper. The kite rises with the wind, and is held in tether by means of a long, light cord. A tail is attached to one end of the kite to steady its movements. The name was suggested possibly by the fancied resemblance between the movements of a kite and those of the bird of that name. Kite flying is an amusement of boys in Europe and America. In Japan, and to a less extent in China, it is a national pastime of men. In these countries competitive flying, with more or less elaborate kites, excites as much interest as horse racing in English-speaking countries.

Of late the construction of kites has attracted the serious attention of scientific men. In 1895 Captain Baden-Powell of England arranged a series of five kites by means of which he was able to raise a weight of 150 pounds 100 feet in the air. Others have succeeded quite as well in raising weights with kites. In 1897 Mr. W. A. Eddy, a Boston operator, sent up a series of nine kites attached to piano wire. They attained an elevation of 5,509 feet and remained up fifteen hours. A string of nine kites, having a surface in all of 170 square feet was sent up to a height of 9,375 feet. Three miles of piano wire were used. Kites are said to have been sent up to a height of four miles. At that height, the air is rarer, but the wind blows faster, so that kites fly as well as they do nearer the surface.

The United States weather bureau has begun to use kites to determine the direction, as well as the moisture and temperature, of the upper currents of air. Special recording instruments have been devised, which are attached to the kites. Mr. Eddy, who has already been mentioned, has also devised a system of cameras which he sends up with a kite and operates by means of a cord, so as to take a complete view of the surrounding country. During the Great War kites were employed for the taking of views of an enemy's fortifications by means of kite cameras. The government of Denmark maintains a kite-flying tower — a weather observatory—at Viborg at the extreme northern point of the kingdom. Kites are already in use for signaling purposes. They are transported more easily and are far less cumbersome than balloons.

Kittiwake, a gull so called from its characteristic cry. The common kittiwake nests in enormous colonies in the rocky cliffs of the northern Atlantic and Arctic Oceans and flies southward in winter. The wings are long and slight. The bill is yellow. It is curved abruptly downward at the tip, and is admirably suited for snatching food from the surface of the sea. The adults are about seventeen inches in length with a wing spread of a yard. The color is snow-white, with a dark pearl-blue mantle. A similar species with coral red beak and legs nests around the North Pacific. See GULL.

Kiwi-Kiwi. See APTERYX.

Klondike, a gold-bearing region in Yukon Territory, Canada. It derives its name from the Klondike River, a tributary of the Yukon. It lies near the Arctic Circle. Gold had been found in various regions of Alaska before the Klondike excitement set in. The Alaska gold excitement set in as early as 1880. The riches of the Klondike were not known until about 1897. In that year a number of miners made their fortunes. One of them appeared in San Francisco in the fall with $130,000 in gold dust. The region may be reached by way of the Yukon River and Dawson, or by way of Dyea and Skagway. In 1921 the Yukon Territory yielded 65,991 fine ounces of gold, the greater part of it coming from the Klondike. See ALASKA.

Klopstock, Friedrich Gottlieb (1724-1803), a German poet. He was educated at the University of Leipsic and at Jena. An edition of his works, published at Leipsic

near the close of his life, extends to twelve octavo volumes. His most important work is the *Messias,* in twenty cantos. The first three cantos were published in 1748, the others appearing at intervals for the next twenty-five years. The book is a poetical treatment of the story of Jesus as given in the New Testament. Klopstock's poem shows the influence of Milton to a marked degree. It was doubtless his aim to write a great epic. Whether the *Messias* is worthy to be so called or not, it is certain that its influence at the time of the publication of the first three cantos was very great. Two schools of criticism existed in Germany at this time. The one, called the Swiss school, demanded that which was natural in literature and held up Shakespeare and Milton as models. The other, led by Gottschied, advocated French models, despised the English, and clung to the formal and artificial. Klopstock's *Messias* was a great victory for the Swiss school. Gottschied's influence was broken, and from this time Germany began to awake to the fact that she might have a national literature. Klopstock's subject was scarcely suited for epical treatment. His poem contains many lyrical passages of a high order. Much of Klopstock's other writing is hardly intelligible. His name is important in the history of German literature, not so much for what he himself wrote as for his influence on the German people, and the expectation which he aroused that Germany would one day produce a great literature of its own, and not be beholden entirely to the ancients and to France. Klopstock began life for himself as a tutor. He held positions in several courts, important now only that they carried with them a pension and gave him opportunity to devote himself to literature and critical work. He lies buried in the village of Ottensen, near Hamburg, in which city he spent the later days of his life. See HEINE; LESSING.

Knapsack. See HAVERSACK.

Knickerbocker's History of New York. See IRVING.

Knight, nīt. See CHIVALRY.

Knighthood, Order of a duly organized order or body of knights. They are of two kinds, the first consisting of fraternities or associations, possessing property or rights of their own, as independent bodies; the second honorary associations established by sovereigns in their own countries. To the first class belong the Knights Templars and Hospitalers; to the second those varied orders established in different lands, as the Order of the Holy Ghost, the Order of the Golden Fleece, etc. In Great Britain there are the Orders of the Bath, the Garter, St. Patrick, St. Michael, and St. George, the Thistle, etc. On the cotninent there are the Golden Fleece of Spain and Austria, the Seraphim of Sweden, the Black Eagle of Prussia, Saint Andrew of Russia and the Legion of Honor of France. Each order has its different insignia, which usually consists of a badge, a collar, a jewel, a ribbon of a certain color, etc.

Orders of knighthood, as they were called existed in the Middle Ages, among these being included such religious orders as were founded during the Crusades.

In this order, as well as in those of a secular nature, there were special vows and obligations taken and conferred, which were scrupulously fulfilled, and others taken voluntarily, for chivalry ran high in those days.

Knights Hospitalers of Saint John, also called *Knights of Saint John of Jerusalem,* and later *Knights of Malta,* a monastic military order founded at Jerusalem in 1048. The monastery was dedicated to Saint John the Baptist, and the monks were called *Brothers of St. John,* or *Hospitalers.* In the early history of the organization the work carried on was limited to hospital service, assisting pilgrims, and caring for the poor and sick. For over 500 years the order fought the Mohammedans, from its headquarters at Malta. When the island was captured by Napoleon the Knights joined issue with Russia and assisted that state against France. England gained Malta in 1800, and the order was thenceforth unmolested, though it ceased to be either a political or military organization. The order returned to its early work, that of caring for the sick and needy. There is at Malta a record of the history of the Knights which dates from the twelfth century.

Knights of Columbus, the leading Catholic fraternal organization of the world, open to male members of the Roman Catholic church, was founded at New Haven, Connecticut, in 1882. The object of the organization is to furnish monetary aid to its members and their beneficiaries, and to promote social and intellectual harmony. At the head of the order is a supreme council, elected by the state councils. Branches of the Knights of Columbus have been established in every state in the United States, in each Canadian province, and in Alaska, Porto Rico, the Philippines and Cuba. During the Spanish-American war the organization did its first war relief work; during the World War it rendered splendid service at home and abroad. In 1922 the membership was 775,000.

Knights of Labor, a noted labor union. The original organization was a local, secret labor union established in Philadelphia in 1869, through the efforts of Uriah S. Stephens, a clothing cutter. He was joined by nine associates, all garment cutters. December 30th of that year the society declared itself Local Assembly No. 1 of the Knights of Labor. Mr. Stephens was elected master workman. Twenty-six additional assemblies were organized in Philadelphia in 1872. In 1873 an assembly of goldbeaters was formed in New York City. The first general assembly was formed in 1878 at Reading, Pennsylvania. Mr. Stephens was chosen grand master workman. The principles of the order, drawn largely from a paper written by G. E. McNeill for a labor congress at Rochester in 1874, declared in favor of the referendum; the establishment of bureaus of labor statistics; occupancy and use as title to land; speedy operation of the courts; safeguards for life and health in factories and mines; weekly payment of wages; the abolition of the contract system in letting public works; provision for arbitration between employers and employed; an age limit of fifteen years for child labor; free textbooks; a graduated tax on income and inheritances; the prohibition of hiring out convict labor; the abolition of the national bank system; the substitution of legal tender, non-interest bearing currency for government bonds; the establishment of postoffice savings banks; public ownership of telegraphs, telephones, and railroads; the encouragement of coöperative stores and factories; equal suffrage; an eight hour law for labor, and compulsory arbitration. A membership of 200,000 was claimed in 1921.

The Knights of Labor organization differs radically from the American Federation of Labor. The former aimed to include all workingmen in one organization. At its height, assemblies were organized in Belgium and other parts of Europe. The American Federation aims to act as an administrative body for the various trade unions, each of which represents the workers in a particular trade or class.

See FEDERATION OF LABOR; TRADE UNION.

Knights of Pythias, a charitable fraternity. It was organized at Washington, D. C., February 19, 1864, by five clerks in the government office. It was designed at first to confine the fraternity to members of this description. The published principles of the order are: Toleration in religion, obedience to law, and loyalty to government. The feature of the organization which has made it extremely popular is the plan of life insurance. The members not only have a good time, but they secure insurance in case of death or sickness at actual cost. There are over half a million members and about 7,000 subordinate lodges. The amount distributed for relief has in some years been not far from $2,000,000. See FRATERNAL ORGANIZATIONS.

Knitting, nit'ting, the art of forming a fabric by means of loops with a single thread. It differs from weaving in that only one thread is used. Crocheting, also, is produced by looping a single thread, the difference being that in crochet work each loop is drawn through the preceding loop while in knitting a series of loops is drawn through the preceding series. Ribbed knitting, particularly desirable on account of its elasticity, is produced by alternating "plain" stitches with those taken backward, or as if the wrong side of the fabric were held toward the knitter. The origin of knitting is much later than that of weaving, and is credited to Scotland. It dates from about

the time of the discovery of America. Caps, that is to say, Scotch bonnets, were knit for some time before stockings and mittens were undertaken. At the present time there are said to be over 5,000 knit articles in the trade. At first the chief material was woolen yarn. Silk, cotton, and wool are now popular materials.

Knitting by hand is done with steel wires, known as knitting needles. Knitting was a popular domestic art for some centuries. It is still practiced largely in many rural communities. Both men and women in Switzerland knit as they drive their cattle to pasture or herd them. A similar practice prevails in some parts of Norway, Scotland, and Germany. The women of New England have been famous knitters.

It is interesting to note that, while the resulting fabric is identical, the German method of hand knitting differs from that commonly employed by the Scottish women. By the Scottish method, common also in America, the yarn is held about the fingers of the right hand. The needle or wire in the right hand is thrust into a loop on the left hand needle. The yarn is thrown between the needles by the right forefinger and the new loop drawn through with the right hand needle. In German knitting, the yarn is held by the left hand fingers. It is first thrown over the left hand wire, then by one movement the right hand needle is inserted in the loop on the left hand needle and draws out the new loop. The latter method is more rapid unless it is desirable to produce an especially close fabric, in which case the yarn must be drawn too tightly to admit of the new loop being taken through the loop on the left hand needle at one movement.

Knitting by hand has given way, however, to knitting machines. A stocking frame was invented by Rev. William Lee of Nottingham, England, in 1589,—nearly three centuries before the invention of the sewing machine. There are many varieties of knitting machines in use. The *circular* machine produces a tubular web of various sizes. If undergarments are made on this machine they must be cut, shaped, and sewed after the knitting process is completed. The *fashioning* or *stockinet* machine knits a flat strip which may be narrowed or widened at any point. The parts of garments may be produced on this and sewed together after leaving the machine. A special "over-lock stitch" machine is in use for sewing the parts of garments together which produces as smooth and strong a seam as can be sewn by hand. One sewing machine is in use in the manufacture of hosiery and knit goods to every three knitting machines. Two different machines are required for knitting plain and ribbed fabrics. As many as five machines are necessary sometimes to the production of one garment.

The first power knitting machine used in the world was put in operation in 1832 at Cohoes, New York. Knitting as a commercial industry was introduced in the United States at Germantown in 1698 by a colony of skilled hand knitters from Hanover. This suburb of Philadelphia is still an important American center of hosiery manufacture. Brooklyn, Cohoes, Amsterdam, and Utica, New York, are important centers. The products of the hosiery and knit goods manufactories of the United States reached in 1905 a value of $136,558,-139. Of this New York state produced about one-third, Pennsylvania about one-fourth. Woolen, cotton, silk, jute, merino, and other vegetable fibers are used in the manufacture of these goods. The use of cotton in their production seems to be increasing. See WEAVING; CROCHETING.

Knot. A measure of the speed of ships, equal to a nautical mile, or 6080.27 feet. It is about 1.15155 land miles.

Knot, nŏt, the interlacement of the parts of a cord; or the union of two threads, strings, cords, or ropes by intertwining loops. In either case the loops may be drawn tight without slipping. The safety of a knot is due to friction. A knot that must be picked open is called a hard knot. A knot tied in such a way that it may be untied by pulling the free ends is called a bow knot. Some of the more important knots are the square, reef, or surgeon's knot, the granny's knot, the overhand knot, the weaver's knot, and the lover's knot.

Know-Nothing Party, a secret political association formed in the United States in 1852. It grew out of an earlier organization dating from 1844. Its main purpose

was to check immigration and prevent the naturalization of foreigners and their participation in American politics. The popular name was applied to the party because its members, when questioned, were instructed to reply, "I don't know." The platform included such catch phrases as "Americans shall rule America," "No North, no South, no East, no West," "Free schools," "No sectarian influence in school or state." The immediate occasion for the formation of the association was the multiplication of the Irish vote in New York City. The opposition to the Irish was largely anti-Catholic in nature. The tide of emigration to this country rose so high about this period that Know-Nothingism became identified with Americanism. The organization became a national political party in 1852. In 1854 it carried the state elections in Delaware and Massachusetts and nearly carried New York. In 1855 the legislatures and governors of five states were elected on a Know-Nothing platform. In 1857 the party had fourteen representatives and five senators in Congress. The Know-Nothings were one of the elements that were merged in the formation of the Republican party. See AMERICAN PARTY.

Knox, nŏks, **Henry** (1750-1806), an American soldier. He was a native of Boston. His father was a shipmaster. Young Henry was a clerk in a bookstore, with abundant opportunity to read. He made himself familiar with military tactics by observation and by questioning the officers of the British garrison then stationed in Boston. He was in the battle of Bunker Hill. When Washington took charge of the forces surrounding Boston, Knox proposed bringing cannon and ammunition from Ticonderoga. Washington gave him authority to do so. He loaded over fifty heavy guns and a supply of ammunition on sleds and brought the whole safely to Cambridge. Under Knox's direction the cannon were mounted on Dorchester Heights. They drove the British fleet out of the bay and the British troops out of Boston. He commended himself to Washington in the battles of Trenton, Princeton, Brandywine, Germantown, and Monmouth. He was with Washington during the trying winter of Valley Forge. In 1785 Congress appointed him secretary of war. He entered Washington's cabinet as the first secretary of the navy in 1794.

Knox, John (1505-1572), a Scottish reformer. He bears somewhat the same relation to the church of Scotland that Luther sustains to the Lutheran Church of Germany. He was born in Haddington, near Edinburgh. He was educated at his native town and at the University of Glasgow, but did not take a degree. For so prominent a man, the details of his life are strangely unknown. He appears to have entered the Catholic priesthood about 1530. In 1546 George Wishart, a Montrose schoolmaster, who persisted in preaching the doctrine of the Reformation, was burned at the stake at St. Andrews by order of Cardinal Beaton. This appears to have determined Knox to join the Reformers, at that time a decidedly dangerous step. He received an invitation to preach to the scattered congregations of Protestants. Cardinal Beaton was assassinated. Civil war broke out. Knox took refuge with Protestant friends in the castle of St. Andrews. The French fleet, coöperating with the Catholics of Scotland, besieged the fortress and took it. Knox, with others, was taken prisoner. He was required, like a galley slave, to labor at a French oar for about eighteen months, when his release was procured at England's intercession. He then went to London. He remained in England during the reign of Edward VI, preaching to Protestant congregations. At the death of Edward and the beginning of persecutions under his successor, Queen Mary, Knox fled to the continent. He became pastor of an English congregation at Geneva, and was closely associated with Calvin. When the Protestant party got the upper hand in Scotland he returned home. When unable to preach in one place he went to another. He traveled throughout the length and breadth of southern Scotland, calling on the congregations to remove the pictures and paintings from the churches and to tear down the monasteries. He was for many years the minister of St. Giles, the principal parish in Edinburgh.

He came into direct conflict with Mary, Queen of Scots, who was an ardent Catholic. He despised her pretty, graceful,

treacherous ways. She wept at his rough, unmannerly bearing. He was called before the privy council more than once, charged with treasonable utterances, but, the majority of the council being Protestants, he escaped with his life. The further details of his life, his contentious spirit, his thunderings from the pulpit, and the broadside of controversial pamphlets sent out by him cannot be entered into here,—perhaps they are no longer profitable. One of his last public sermons was a denunciation of the French king for permitting the massacre of St. Bartholomew. He was a stern and rigid partisan and a vehement speaker, but not a logical thinker.

He was buried in the churchyard of St. Giles. When his body was laid at rest the Earl of Morton, regent of the kingdom, remarked "Here lieth a man who, in his life, never feared the face of man, who hath been often threatened with the dagger, but yet hath ended his days in peace and honor." His resting place appears never to have been marked securely. The old burying ground has been effaced to permit the erection of new buildings. The exact place of his grave is therefore unknown. He had five children, but it is believed that there are now no descendents. There is not even an authentic portrait of the great preacher.

See EDINBURGH; PRESBYTERIAN.

Knox, Philander Chase (1853-1921), an American political leader, was born at Brownsville, Pennsylvania. He was educated in Ohio, and upon completion of his education was admitted to the bar. He rose rapidly in his profession, and became a prominent corporation attorney in Pittsburgh, Pennsylvania. After serving a number of years as assistant United States District Attorney, he was appointed Attorney-General by McKinley in 1901. He was retained by Roosevelt, but resigned his position in 1904 to become United States Senator from Pennsylvania, filling the vacancy caused by the death of Senator Quay. At the end of the appointment, he was elected for a full term and remained in the senate until 1909, when he resigned to accept the position of Secretary of State under President Taft. At the close of Taft's administration, Mr. Knox again returned to the practice of law, but he was reelected to the Senate in 1916.

Senator Knox became prominent during his term as Attorney-General. He brought suits for the dissolution of a number of the great corporations which were combinations in restraint of trade and in winning the suit against the Northern Securities Railway Merger, he proved that such combinations were illegal and ended further attempts at their formation. His administration of the office of Secretary of State was founded upon a broad nationalism. He strengthened the position of the United States in the Caribbean Sea and in China by coming to the assistance financially and commercially of the nations in these respective parts of the world. He favored paying Colombia for the Panama Canal concessions and was a supporter of the recent treaty with that nation. His knowledge of international affairs was profound and his judgment concerning foreign relations was seldom questioned. He was the first to object to the League of Nations Covenant in the Treaty of Versailles, and with Senator Lodge was a leader in opposing the ratification of the Treaty. He was the author of the resolution declaring the state of war with Germany and Austria at an end and he proposed a new world organization as a substitute for the League of Nations.

Knoxville, a city in Tennessee, at the head of navigation on the Tennessee River. It is located in a region rich in iron, coal, marble, and zinc, and is the headquarters for the operators of many mines. The city is built on low hills and in the valleys between, ranges of both the Alleghany and the Appalachian mountains are visible from several places in the city. The name is in honor of General Knox, officer in the Revolution and the first secretary of war. Important manufactures are marble, flooring, cotton, and woolens, furniture and cabinet mantles, foundry products, stoves, coffins, iron fencing, and ready-made clothing. The University of Tennessee, the East Tennessee Female Institute, the University Preparatory School, Tennessee Normal College, St. Mary's Academy, and Knoxville College, a Presbyterian school for

colored students, are located here. Other institutions are a large hospital, the Home for Aged Women, the Industrial School for Juveniles, and an orphanage. In 1920 the population was 77,818.

Knute or **Canute,** ka-nūt′ (995-1035), king of England, Denmark, and Norway. Without going through the details of his reign, it is sufficient to say that he is one of the great figures in Scandinavian history. He was the first Danish king of England. At his death the three kingdoms were divided between his three sons. Accounts, no doubt largely traditional, describe him as a man of commanding appearance and large views, disposed to maintain the rights of the common people. He encouraged the spread of Christianity throughout his vast dominions. His courtiers having endeavored to flatter him, as did those of Alexander the Great, with a notion that he was divine, he ordered his throne to be placed on the seashore at a low tide. As the tide rose he ordered the waters to go back nor dare to wet his feet,—the feet of him who was lord of the land and of the ocean. The water continuing to rise he turned rebukingly to his flatterers saying, "Let all men know how empty and worthless is the power of kings; for there is none worthy of the name but Him whom heaven, earth, and sea obey."

Kobe, Japan, is a treaty port of entry, in the island of Hondo, and northeast of the prefectural city of Hiogo. When, in 1886, Hiogo was opened to foreign residence and commerce, Kobe became the foreign residential quarter and the center of trade, its municipal affairs being handled by a council consisting of the prefect, the foreign consuls and three elected members. In 1892, Kobe and Hiogo were united. The city is situated along a beautiful sandy beach, and at the base of the high coast range. It has a commodious and safe harbor; is connected by rail with all parts of the main island, Hondo; and has direct steamer connection with America, Europe, Australia, China and Formosa. It is considered the most atractive and healthful of the treaty ports. Opened later than Nagasaki and Yokohama, Kobe has gone to first place as a shipping and trading center. In 1920 the population was 608,628.

Koch, Robert (1843-1910), a noted German physician and bacteriologist. He was born at Klausthal, Hanover. He received a medical education at Göttingen, and was for a time assistant surgeon in the Hamburg general hospital. He practiced medicine in Langenhagen, in Rachwitz and in Wollstein, beginning his bacteriological researches while at the latter place. In 1882 Koch succeeded in isolating the bacillus which causes tuberculosis, and in 1884 identified the cause of cholera in the comma bacillus. For this last service he received by legislative act a gift amounting to $25,000. In 1885 he was appointed to a professorship in the University of Berlin. In 1890 Koch announced the discovery of tuberculin which he believed would stop the growth of the tubercle baccillus. While it has not proved a cure, tuberculin is used in testing for tuberculosis in cattle. For some of his research work Koch was obliged to invent new appliances, and new methods of staining specimens to render visible the microorganisms. His services of this kind are of immense value to the cause of bacteriological study. He was the author of *Investigation of Pathogenic Organisms, On Cholera Bacteria, and On Bacteriological Investigation.*

Kodak. See CAMERA.

Kohinoor. See DIAMOND.

Kokomo, Ind., a prosperous manufacturing city, and the county seat of Howard County, is on Wildcat River, 54 miles north of Indianapolis. It is served by three steam roads and several electric lines. The principal manufactures are plate and opalescent glass, automobiles, paper, bits, nails, tools, electrical goods, stellite, pottery, staves, malleable iron, chemicals, ice skates, coaster toys, carburetors, celluloid and trunks. The first gasoline automobile made in the United States was constructed at Kokomo by Elwood Haynes. The city contains a high school, a Carnegie library, several public playgrounds and a large public park. In 1920 the population was 30,067.

Konigsberg, Germany, an important

industrial city and fortress of East Prussia, is about 366 miles northeast of Berlin. The city was founded as long ago as 1255, but was not fortified until 1626; it was made a first class fortress in 1843. Konigsberg is on the Konigsberg Ship Canal, connecting with Pillau, on the Bay of Danzig. The principal manufactures are machinery, pianos. tobacco, cigars, clothing and thread. There are large establishments for the preparation of meerschaum. The chief items of the extensive commerce of the city are tea, Prussian amber and corn. Konigsberg is a thoroughly modern city, though a few historic buildings still stand, one of which is the Castle Church, the place of coronation of Frederick I and William I. The city contains a university attended by about 2,000 students, a fine library, a zoological museum, an observatory and a large botanical garden. The German pholosopher Kant was born in Konigsberg and was buried here. The population was 260,895 in 1919.

Kootenay District, or as it is sometimes called, Kootenay County, is a triangular section of land that embraces all of British Columbia south and east of the Big Bend of the Columbia River and has an approximate area of 22,000 square miles. Thus it contains almost all of the drainage basin of the Kootenay River and some 7,500 square miles of the Columbia River basin. There are large tracts of arable land in the District, producing fruit and cereals; and gold, silver, copper, lead, zinc, coal and petroleum are found. Mining, in fact, is the principal industry. Dairying and stock-raising are important, and in the forested areas the lumbering industry is carried on. The District is served by the Kettle Valley and Canadian Pacific railways, and numerous lakes and streams are navigable in season. Mountains and valleys alternate in this region; game abounds, and trapping is followed by many people. The Kootenay River rises in the District and after flowing a distance of 450 miles, first south for 200 miles, then turns and flows north, uniting finally with the Columbia. The headwaters are in the Rockies, on the western slope. The principal cities of Kootenay District are Revelstoke, Rossland, Nelson, Fernie and Trail.

Kopeck, kō′pĕk. See RUSSIA.

Koran, kō′ran or kō-rän′, the sacred book of the Mohammedans. It was written by Mohammed in Arabic, and professed to be a direct revelation from Allah to him. One tradition asserts that it was inscribed on tablets by a ray of golden light direct from heaven. The parchment employed was made from the skin of the ram that appeared to Abraham, and was sacrificed by him in place of his son Isaac. There are other traditions,—one that the Koran was composed by Mohammed at different times and preserved on scraps of various material, subsequently arranged by Mohammed's father-in-law. In 650 A. D. the caliph Othman caused an official copy to be made. In order that there might be no disputes as to the text he ordered all other fragments and copies to be destroyed. The historic and probable theory is that at first the Koran was not written at all, but was committed to memory. Later, when those who were most familiar with it were killed in battle or died off, the caliph Othman deemed it wise to reduce it to writing.

At all events, the Koran is a complete code for the government of the Mohammedan church. It is divided into 114 chapters. Although the influence of the Persian magi may be detected, the writer was evidently familiar with both the Old and the New Testament. Much is made of the doctrine of the resurrection and the last judgment. The language used as to the sounding of the trumpet and the rising of the quick and the dead to receive the final reward of their deeds is almost Scriptural. The moral tone which prevails throughout is evidently derived from the Hebrew writers. Prayer, fasting, alms, pilgrimages to Mecca, ablutions, and purifications are enjoined. Polygamy and divorce are permitted. Idolatry is forbidden. Death in the cause of Mohammedism is meritorious. As to the private virtues—charity, humility, courage, faith, and justice are taught. As to the influence of the Koran, it may be said that, even at this date, it is read aloud in the presence of more people and has more influence on private conduct than any other book ever written or printed, even the Bible not excepted. As Gibbon says, "From the Atlantic to the Ganges the Koran is ac-

knowledged as the fundamental code, not only of theology, but of civil and criminal jurisprudence; the laws which regulate the actions and the property of mankind are guarded by the infallible and immutable sanction of the will of God." Its bulk is about equal to that of the New Testament. When read, it must be kept on an elevated stand. It must not be opened or touched without previous washing of the hands and purification. It is not a book for the common people to handle.

EXTRACTS FROM THE KORAN.

God, there is no God but he, the living, the eternal. Slumber doth not overtake him, neither sleep; to him belongeth all that is in heaven and earth. . . . He knoweth that which is past and that which is to come unto them, and they shall not comprehend anything of his knowledge, but so far as he pleaseth. His throne is extended over heaven and earth, and the upholding of both is no burden to him.

There is no piety in turning your faces towards the east or the west, but he is pious who believeth in God, and the last day, and the angels, and the Scriptures, and the prophets; who for love of God disburseth his wealth to his kindred, and to the orphans, and the needy, and the wayfarer, and those who ask; . . . who observeth prayer, and payeth the legal alms, and who is of those who are faithful to their engagements . . . and patient under ills and hardships, and in time of trouble; these are they who are just, and those who fear the Lord. . . . Whoso doeth the good works and is a true believer, whether male or female, shall be admitted into Paradise. . .

Verily we have revealed unto thee (O Mohammed), as we revealed unto Noah and the prophets after him, and as we revealed unto Abraham and Ishmael and Isaac and Jacob . . . and Jesus and Job and . . . Solomon. . . .

They to whom we have given the book of the Koran, and who read it with its true reading, they believe therein; and whoever believeth not therein, they shall perish. . . .

Perform the pilgrimage of Mecca. . . Make provision for your journey; but the best provision is piety; and fear me, O ye of understanding. It shall be no crime in you, if ye seek an increase from your Lord, by trading during the pilgrimage. . . .

Fear God by whom ye beseech one another; and respect women who have borne you, for God is watching over you. . . Take in marriage of . . . such . . . women as please you; two, or three, or four, and not more. But if ye fear that ye cannot act equitably towards so many, marry one only.

Korea, or Chosen, once a kingdom of Asia, is now an integral part of the Japanese Empire. It is in the Pacific, northeast of China, and consists of a peninsula running southward from Manchuria. It is separated from Japan by the Japan Sea, and from China on the southwest by the Yellow Sea. It has an area a little less than that of Florida and South Carolina combined. In point of latitude it stretches from that of South Carolina to that of Central New York. The peninsula is traversed by mountains, the highest rising to an altitude of 8,000 feet. The eastern side of the ridge is covered with forests to the summit. The coast rises sheer from the water's edge for 300 or 400 miles. The western slopes are treeless and broaden out into wide, fertile plains extending down to the Yellow Sea. The capital is Seoul, on the chief river thirty miles inland. Chemulpo, at the river's mouth, is the chief port. The southern end of the peninsula is said to have a climate much like that of the Carolinas. The mountains and northern portion are more like New England. At Seoul, during three winter months, the river is frozen over sufficiently to allow the passage of carts. The average rainfall is thirty-six inches.

The country is rich in minerals. Iron, copper, gold, and silver ores abound, but the mineral output is not large. The forests contain an immense quantity of hardwood and evergreen timber suitable for lumber. The country is of great interest to the botanist. Hunters find deer and various fur-bearing animals, as the beaver, badger, otter, and marten. In the summer season the woods are full of birds. The forests still shelter foxes, wolves, and leopards. In the southern part of the country, long-haired tigers are still a scourge. An old tiger that has learned to eat human beings —a man-eater as he is called—does not hesitate to enter a village and even to tear off the thatched roof of the wretched mud huts of the natives in search of his prey.

Half a million dollars' worth of ginseng is collected annually in the mountains for the Chinese market. The principal crops are rice, wheat, millet, Indian corn, beans, cotton, and hemp. Cattle are the chief domestic animals. Oxen are the usual beasts of burden. There are a few small, hardy ponies. Like China, Korea is famous for poultry. A few hogs are raised.

The population is about 17,264,119. The people are a mixed race, allied in blood and language, however, to the Japanese and to

the Chinese. Korea has been overrun repeatedly by the Chinese and by the Japanese, but managed to maintain a sort of independence. Until of late Korea was known as the "Hermit Kingdom." Foreigners were not allowed to enter. The Chinese language held much the same relation to Korean literature and to official life that French had in Germany during the reign of Frederick the Great. Missionaries who forced their way in were persecuted, even massacred. Japan was the first nation to secure the opening of a Korean port for trade. This occurred in 1876. Later, other nations were granted trading privileges. A commercial treaty was formed with the United States in 1882, with Great Britain and Germany in the following year, and with other nations soon after. In 1894 the Chinese endeavored to revive an ancient claim of protectorship over Korea. Under Japanese influence the Koreans proclaimed entire independence. In a war which followed the Japanese and Koreans defeated the Chinese utterly. The Japanese expected to absorb Korea, but Russia stepped in and, like an unjust judge deciding between two litigants, took Korea for herself. In 1905 after ten years of diligent preparation, Japan summoned Russia to evacuate. Failing to obtain a favorable response the Japanese attacked the Russians, and, after one of the pluckiest and most decisive wars in history, drove the Russians out of Korea. The war cost Japan $675,908,185—a large sum when we reflect that the United States bought Louisiana for $15,000,000 and Alaska for $7,200,000.

At this time an agreement was made between Korea and Japan, whereby the Japanese government assumed control of the foreign relations of Korea. Under this agreement a Japanese resident-general was stationed in Seoul, and Marquis Ito became first Resident-General. In 1907 Korea gave the resident-general the right to approve administrative measures and important appointments, and the Japanese became eligible to official positions in Korea. In 1909 Japan was given control of the administration of justice, and finally by a treaty concluded August 23, 1910, Korea was annexed to the empire of Japan. The emperor of Korea lost all political power, the title of the country was changed to "Chosen," and the office of Japanese governor-general was established. Oppression by the Japanese has led to several uprisings of the Koreans, but these have been suppressed with the greatest cruelty by the Japanese soldiers.

See MANCHURIA; JAPAN; ITO.

Kosciusko, kŏs-sĭ-us'kō, **Thaddeus** (1746-1817), a Polish patriot. He was a native of Lithuania. He was well born and was educated in the military school at Warsaw. A disappointment in love affairs caused him to leave his native country. In 1777 he came to America and offered Washington his sword in defense of liberty. The latter was delighted to have the help of an officer educated thoroughly in military science. Kosciusko was made a colonel and later a brigadier-general. By virtue of his skill, bravery, and knowledge of fortifications, he rendered the American cause signal service. At the close of the war Congress gave him a vote of thanks and conferred on him the rank of major-general. Kosciusko then returned to Poland and served in the army of his native country with a rank of lieutenant-general. At the second partition of Poland he withdrew to Leipsic, yet returned in 1794 to take part in the final war with Russia. He was at first victorious, but was later defeated and taken prisoner. He was held by the Russians two years, then set at liberty. He visited England, the United States, and France, being received everywhere with the highest honor. In 1814 he endeavored, without success, to bring about a semi-independence of his native land, desiring the czar to be content with the title, King of Poland. He emancipated the serfs on his paternal estates. While residing in Switzerland he was killed by a fall from his horse. In the following year Alexander, czar of Russia, sought to win the affection of his Polish subjects by a gracious act. The body of their great leader was brought home at imperial expense and buried in the cathedral of Cracow, where a monument has been erected in his memory.

Kossuth, kŏs'sōōth, **Louis** (1802-1894), Hungarian patriot. He was descended from a Protestant family of high rank.

In 1832 he entered the Hungarian Parliament. To understand his life it must be remembered that Hungary was held at that time by Austria, practically as a southern province. He was a member of a party that favored independence from Austria. He became the editor of a secret newspaper circulated in writing. For this offense he was imprisoned for a time. He held various positions in the Hungarian government, always opposing the views of the Viennese, that is to say, the Austrian party. In 1848 he was instrumental in organizing a revolutionary outbreak with a view to throwing off Austrian domination. The movement assumed large proportions, and might have been successful, it is believed, but for the interference of Russia in favor of the Austrians. In 1849 Kossuth was obliged to flee the country. He was intercepted by the Turks and held prisoner for two years, being liberated finally through the influence of Great Britain. He then visited England and the United States. He was received in this country with great enthusiasm. Matters were patched up between Austria and Hungary in 1867. Kossuth was then at liberty to return to his native land, but preferred to live abroad. He died at Turin, Italy, never fully satisfied with the formation of the Austria-Hungarian government.

Kremlin, in Russia, a general name for a fortified citadel. The Kremlin of Moscow is the most celebrated. The term corresponds to Acropolis in Greek history. See Moscow.

Kronstadt, krōn'stät, the seaport of St. Petersburg. It is situated on an island in the Gulf of Finland opposite the mouth of the Neva. Lines of steamers run from Kronstadt to Stockholm, Stettin, Lübeck, Havre, etc. Population, about 60,000. It is the chief naval fortress of Russia and is the headquarters of the Russian navy. It was for this naval station and a water frontage that Peter the Great removed his capital from Moscow and built up a new city at St. Petersburg. See St. PETERSBURG.

Kropot'kin, Peter Alexeievitch, Prince (1842-1921), a Russian nihiiist and geographer. He was born at Moscow of wealthy parents, and educated at St. Petersburg. After a few years in the army he tried, as a member of a prison commission, to introduce reforms into the political prisons of Siberia, but in vain. For a time he served the government in geographical explorations, for which he gained the gold medal of the Russian Geographical Society. But the down-trodden condition of his countrymen, coupled with socialistic ideas he had been studying, led him to work among the common people of St. Petersburg, spreading his doctrine of reform. Arrested in 1874, he escaped to England two years later, and then went to Switzerland where he founded an anarchistic paper called *The Revolt.* He was driven from there, and later arrested in France, being released only on the appeal of many men of influence. Of late years his home has been in London, where he writes on scientific subjects. Prince Kropotkin embraces in his doctrine opposition to all societies based on restraint and looks forward to a time when society shall be constituted on a communistic basis. In 1901 he gave a course of lectures in Boston.

Kruger, kroo'ger, **Paul** (1825-1904), a Boer statesman. He was born in Cape Colony. He moved north with his people when they were forced out by British aggression. From early boyhood he was connected with the army of the Boers. In 1883 he was made President of the Transvaal Republic, a position which he held continuously until 1900. He was known affectionately as "Oom Paul." During the war with Great Britain he escaped eastward into Portuguese territory and set sail for Europe, hoping to secure assistance for his country in the gallant struggle it was making for independence. He left his wife behind, but took much private treasure. He was unsuccessful in his mission. He passed the remainder of his days in Holland. See BOERS.

Krupp, krōōp, a German family of iron workers. Friedrich Krupp, the foundet of the family, built up a small forge at Essen, Prussia, employing three men. He was a man of character and ingenuity. His son Alfred came into control of the works in 1848. He was the first in Germany to introduce the Bessemer steel process and the steam hammer. He made a fortune in the manufacture of iron for bridges, steel rails, cannon, and other heavy work. He built up

an establishment employing 20,000 men. Friedrich Alfred Krupp, his son, who died in 1902, continued the work and became the wealthiest man in the German empire. He was the Andrew Carnegie of Germany and employed over 43,000 people. The firm is celebrated especially for the strength and accuracy of its cannon. The siege guns used at the siege of Paris in 1870-71 were Krupps, also the "Big Berthas" used to bombard Paris in 1918. They were nicknamed after Bertha, the sister of Friedrich. She is present owner of the works. Rifles, car wheels, and armor plate are also specialties. The Krupps were true captains of industry. They converted Essen from a village into a city. Their works, among the greatest in the world, cover 150 acres. The firm has bought up coal and iron mines. A shipyard at Kiel and engine shops at Berlin, as well as other iron works, have increased the facilities of the firm. A fleet of Krupp ships is used to carry material and place goods on the market. Essen, still the headquarters is a thriving city with a population of 443,300. Following the Peace Treaty, the war materials on hand at the Krupp works were destroyed, the metal being resmelted and used for other purposes. The working force was greatly reduced, and a large part of the plant equipment was turned to the manufacture of locomotives. The plant can turn out one completed locomotive a day. Heavy machinery and agricultural implements are also produced in great quantities.

Ku Klux Klan, kū'klŭks-klan, in American history, a secret organization of men in the South. It was founded at Pulaski, Tennessee, in 1866. Its objects were primarily to prevent the newly enfranchised negroes from voting; to drive out carpetbaggers, and to intimidate scalawags. No doubt the notion of having amusement contributed to the popularity of the plan. The outward manifestations of the Klan were parties of horsemen abroad at night. They wore long robes, white masks with holes for the eyes, mouth, and nostrils, and were set off with tall pasteboard hats, such as may be seen on the heads of heretics in pictures of the Spanish Inquisition. The leader controlled the movements of his band by well understood signals given on a small whistle. Negroes who had given offense by political activity were called from their cabins at night, tied to a tree, and whipped, or treated even worse. White men who made themselves objectionable to their neighbors were waylaid and were fortunate if they escaped with their lives. Whatever the motives of the founders and managers may have been, the organization led to such outrages that it was condemned both by an enactment of Congress and by the better sentiment of the South. The organization is stated, on trustworthy authority, to have included over half a million members at one time. It was disbanded in 1869.

The Klan was revived in 1915, ostensibly for social purposes. But remembrance of the old order still lingered in the minds of those of the Civil War days, and the organization at once met with bitter opposition. Nevertheless, starting in Atlanta, the organization spread in five years to nearly every state in the Union. The opposition to the Klan became so strong that a congressional investigation of its activities was ordered in 1921, but no illegal acts were proved. Foreign born citizens, Negroes, Jews and Catholics are not admitted to membership. It is claimed by members of this organization that it stands for loyalty to the United States and staunch Americanism.

Kumquat, kŭm'kwŏt, a small tree of the orange family, very common in China and Japan. The fruit is oval, about the size of a pigeon's egg, has a sweet rind, and acid pulp, and is highly valued by the Chinese who make preserves of it. Both fresh and preserved kumquats are sold in American markets.

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Laboratory, a room or workshop fitted up with apparatus suitable for conducting scientific investigation. Although the term is suggestive of school and college, it is applied quite as properly to the department of investigation and testing maintained in all considerable manufacturing plants. Cotton mills have laboratories in which material is examined carefully, and in which dyes are mixed and tested. The manufacturing chemist has all materials tested for strength and purity in the laboratory. A private room in which experiments are made is a part of every well established gas plant, powder mill, spice factory, flouring mill, etc.

The chemical laboratory of the school and college is derived from the workshop of the druggist, the study of the physician, and the secret room of the alchemist and the astrologer of the Middle Ages. The latter was a private room in which the search for the philosopher's stone was carried on, and in which potions and charms were concocted. The first known laboratory in connection with an institution of learning was opened at the University of Altdorf, Switzerland, in 1683; but laboratories were not considered a necessary part of a university outfit until the middle of the nineteenth century. Count Rumford set up a laboratory in the Royal Institution of London in 1800; a physiological laboratory was established at Breslau in 1825; Baron von Liebig, the great meat extract man, set up a chemical laboratory in the University of Giessen in 1826. Those of the Universities of Heidelberg and Glasgow were established in 1846. The first educational laboratory in the United States is said to have been established by Rensselaer Polytechnic Institute about 1825. The first zoölogical laboratory in the United States was perhaps that established by Alexander Agassiz at Harvard.

Laboratories for the study of chemistry, physics, and biology are now so generally recognized as a necessary part of educational equipment that the laboratory of a progressive village high school surpasses that of the average college fifty years ago.

See ALCHEMY; CHEMISTRY.

Labor, United States Department of. Organized as recently as 1913, this executive department of the United States Government had been urged continuously since the Civil War. Although more than 100 bills and resolutions anticipated the department as it now stands, Congress failed to enact any legislation in response to the general appeal of wage-earners for a department of the Federal government representing solely their interests, until 1884. In that year the Bureau of Labor, under the jurisdiction of the Department of the Interior, was created. Four years later the bureau was transformed into an independent department with the title of Department of Labor. Its executive was titled Commissioner of Labor. He had not sufficient rank to be called into the cabinet circle by the president, and labor was dissatisfied at not being able to carry its interests directly to the highest council of the government. Meanwhile there was public agitation for an executive department in the interest of commerce. Finally Congress decided to establish an executive department jointly representing the interests of business and those of wage-earners. Accordingly, in 1903, the Department of Commerce and Labor was created, the Department of Labor coming under its jurisdiction rechristened as the Bureau of Labor. For ten years the welfare of wage-earners and that of employers was administered by the same department. Naturally such interests frequently opposed each other; the administration of their affairs was not always satisfactory, and in 1913 the Department of Commerce and Labor was resolved into the Department of Commerce, and a new act created the Department of Labor as it now exists, represented in the cabinet by a secretary.

"The purpose of the Department of Labor shall be to foster, promote, and develop the welfare of the wage-earners of

the United States, to improve their working conditions, and to advance their opportunities for profitable employment." To this end there are five administrative departments: The Bureau of Labor Statistics, Bureau of Immigration, Bureau of Naturalization, the Children's Bureau, and the Division of Publications and Supplies.

Food, clothing, hours of work, wages, employment, sanitary condition of houses and workshops, competition of convict labor, industrial education, labor legislation, and prevention of child labor are among the subjects investigated.

Labor Day, in the United States, the first Monday in September. In 1882 the Knights of Labor of New York held a parade on this date. The celebration proved immensely popular. Labor Day is now (1920) a legal holiday in all the states and territories including the District of Columbia. In Louisiana it is observed only in the parish of Orleans. The usual features of the day are monster parades and addresses by prominent leaders of labor. The first of May, that is to say, Mayday, has been adopted by the workingmen of Europe as the date on which to make an annual demonstration. In London, Paris, and other large cities immense assemblages of workingmen meet in the public parks and listen to speeches. In previous years these European meetings were not infrequently accompanied by rioting and conflicts with the police, especially in London, but they are now characterized by good order.

Labor Legislation, a general term applied to laws affecting the rights, privileges and duties of wage-earners, or the relations of employer and employed. Such legislation is commonly said to have had its beginning in the Factory Acts of Great Britain, some of the provisions of which have served as a model for similar enactments in the United States and other countries. These acts were dictated by motives of humanity, and were primarily designed to regulate the hours of work, preserve the health, and promote the education of young persons employed in British mills and factories. The leading act was passed early in the reign of Queen Victoria, in 1844, though much had already been done to improve working conditions for the young by statutes passed in 1802 and 1834. These acts prohibited night work, with some exceptions, in the case of persons under 18 years of age, and limited their hours of labor to twelve, including one and a half hours for meals. "The employment of children under nine was prohibited, except in silk-mills; and under 13 the hours were restricted to eight a day, or ten in silk-mills." Silk-mill operators evidently had some "pull" in those pioneer days of labor legislation.

Inspectors of factories were appointed under a statute of William IV, and the Factory Act of 1844 set forth the powers and duties of these inspectors more clearly; also laid down regulations for the protection of children working in flax-mills, and provided that the mill-gearing should not be cleaned while in motion, and that the machinery should be guarded. Later acts extended protection to young workers in other industries, and prescribed working conditions in detail. In recent years labor legislation in Great Britain has been of the most liberal character.

In the United States, labor legislation is largely a matter of state concern, and the labor laws of the various states often differ widely. Many of them deal with the labor contract, and almost every state has laws governing the employment of children, which is prohibited in some states, but permissible in others, under restrictions as to age, health, etc. The hours of work for women are also generally regulated by statute, and laws restricting the hours of labor in dangerous employments are increasing in number. A determined attempt was made in Congress in the early months of 1923 to pass a national child labor law, prohibiting the employment of children under 14, but it failed of passage in the closing hours of the 67th Congress.

Workmen's compensation acts have been passed by practically all the states. These laws, which have generally superseded the old employer's liability acts, affirm the principle of the common law, that the employer is liable in pecuniary damages for

the bodily injury or death of his employes by accident when in his employ, in so far as such accident is not due to the negligence, direct or contributory, of the employe. The employer's defense of contributory negligence by a fellow-servant is voided by most of the recent compensation acts, which provide in great detail for rates of compensation, methods of procedure in case of injury by accident, etc., and place upon the employer, in case of dispute, the burden of proof that the employe himself was grossly negligent. Such laws were enacted in 24 states in a recent period of four years. Liability insurance for the employer is also usually provided for by workmen's compensation acts.

Federal employes are similarly protected by the Federal Employes' Compensation Act, approved September 7, 1916, which provides that compensation shall be paid by the government for death or disability of employes of the United States resulting from a personal injury sustained while in the performance of duty.

Up to recently the greatest uncertainty existed regarding the legal status of almost every act which may be done in connection with a labor dispute. The general effect of the decisions of American courts, however, in the interpretation of laws affecting employer and employed, has been to restrict the activities of labor organizations and deprive them of what they regard as their most effective weapons, namely, the boycott and the power of picketing; while on the other hand, the weapons of employers, namely, the power of arbitrary discharge, of blacklisting, and of bringing in strikebreakers, have been maintained, and legislative attempts to restrict the employers' power have generally been declared unconstitutional by the courts. Furthermore, an additional weapon has been placed in the hands of employers by many courts, in the form of sweeping injunctions, which seemingly render punishable acts which would otherwise be legal, and also deprive strikers of the right to immediate jury trial for acts of infringement. A notable case of the use of the injunctive power of the courts was seen in 1922, when the United States Government procured a sweeping injunction from the Federal court in Chicago to prevent interference with railroad operation and property during a railway shopmen's strike of national character.

An important labor decision was announced by the United States Supreme Court on June 5, 1922, when the court held that unincorporated labor unions may be sued in the Federal courts for their acts, and that funds accumulated to be expended in conducting strikes are subject to execution in suits for wrongs committed by such unions in strikes. The case was an appeal by the United Mine Workers of America and sixty-five individuals from a decision by the United States District Court for the western district of Arkansas, approved by the United States Circuit Court of Appeals for the eighth district, holding them guilty of violating the Sherman Anti-Trust Act in the course of the coal-mine strikes in Arkansas in 1914, and imposing damages of $200,000, which were trebled under the anti-trust law.

Chief Justice Taft of the United States Supreme Court, in a decision announced December 5, 1921, cleared up the law regarding picketing. He held that peaceful picketing in labor disputes is lawful, but where such picketing involves methods inevitably leading to intimidation and obstruction, no matter how lawful the announced purpose, it becomes illegal and may be restrained by court injunction. This decision involved a construction of the Clayton anti-trust law, which restricts the use of the injunction against organized labor.

The establishment of the United States Railroad Labor Board by the Transportation Act, 1920, was an important piece of labor legislation. The Labor Board had a stormy career for a few years thereafter, and it was against one of its decisions reducing their wages from the wartime level that the railway shopmen struck in 1922 and disrupted the transportation system for several months. Other labor legislation in recent years has included minimum-wage laws, especially for women, in several states; but the interests of labor are so closely interwoven in the United States

with those of the community as a whole that almost every statute of social effect may be classed as labor legislation.

Labor Union. See TRADE UNION.

Labouchere, Henry Du Prey (1831-1912), an English journalist and diplomat, was born in London, and educated at Eton and at Cambridge. From 1854 to 1864 he was in the diplomatic service, serving at Washington, D. C., for a time. In 1876 Mr. Labouchere established *Truth,* a society and political journal in which public matters were subjected to an acute censorship. He later became one of the proprietors of the *Daily News,* and was city editor of the *World.* Mr. Labouchere consistently espoused the cause of Home Rule for Ireland, and his sympathies were decidedly pro-Boer during the South African War. In 1896 he was a member of the royal commission to inquire into the Jameson raid, and his inquiries and criticisms were plainly disconcerting to the party of Cecil Rhodes.

Labrador Plateau, a vast peninsula of eastern Canada. Its limits are somewhat indefinite, but it extends from the Gulf of St. Lawrence to Hudson Bay. The area is estimated at 120,000 square miles, but the population is comparatively very small. A small part of the plateau lying along the Atlantic coast belongs to Newfoundland. The portion which formerly comprised the Territory of Ungava was annexed to the Province of Quebec in 1912 by an act of Parliament. Labrador lies in the same latitude as the British Isles, but, owing to the influence of Arctic currents, the climate is more like that of Iceland. The entire peninsula is a table land of ancient rocks, having an average altitude of about 2,000 feet. The Atlantic coast is precipitious, rising to a height of from 1,000 to 8,000 feet. It is intersected by numerous inlets. The cliffs are inhabited by myriads of nesting water fowl. The Labrador duck, a beautiful sea species, is now extinct. The interior of Labrador is not well known. There are numerous rivers, teeming with salmon and other fish. Travelers have made their way upward in canoes for hundreds of miles. The interior is a land of elevated morasses, bare rocks and forests of birch and fir. The mineral resources are said to be large, but they have as yet hardly been touched. The forests are inhabited by the lynx, fox, wolf, marten, otter, weasel, bear, beaver, muskrat, and other fur-bearing animals. The barrens, as they are called, are occupied by herds of caribou that feed on the reindeer moss. The inhabitants, about 6,000 in number, are chiefly Algonkin Indians, who are at perpetual enmity with the few Eskimos who dwell along the northern border. In the spring, they come down the streams with bales of fur. The winter is long and of Arctic severity. The summer is short and warm. Those who do not mind swarms of mosquitos, flies and "no-see-'ems" find the wilds of Labrador a summer paradise. The Atlantic coast is visited by many thousand fishermen from Newfoundland, Canada, and the United States. The catch of cod, herring, salmon, and trout is valued at several million dollars a year. See COD; CANADA; SAGUENAY.

Labradorite, a variety of feldspar that consists of aluminum, calcium and sodium silicate. It is usually met with in dark gray cleavable masses, and it formed an essential characteristic of the early rocks. Some varieties of labradorite are beautiful when polished, showing rich shades of blue, green and bronze. It is used for table tops, and for such small articles as snuff boxes, and other trinkets. It is found in northern Europe, but the finest grade occurs in Labrador, whence the name.

Laburnum, a small tree of the pea family. It is related to the honey locust. It grows wild in the Alps and other mountain chains of Europe. It is much cultivated in parks for the sake of the beautiful, long, hanging racemes of yellow, pea-shaped flowers. It is also called golden chain and beantrefoil. Tennyson speaks of "laburnum's dropping wells of fire." The seeds contain poisonous alkaloids. They are used in medicine. The heart wood of the laburnum is dark colored and coarse grained, but, like the locust, is hard and durable. It is much in demand among the cabinetmakers, by whom it is sometimes called the "ebony of the Alps." It takes a high polish and is widely used for inlaying.

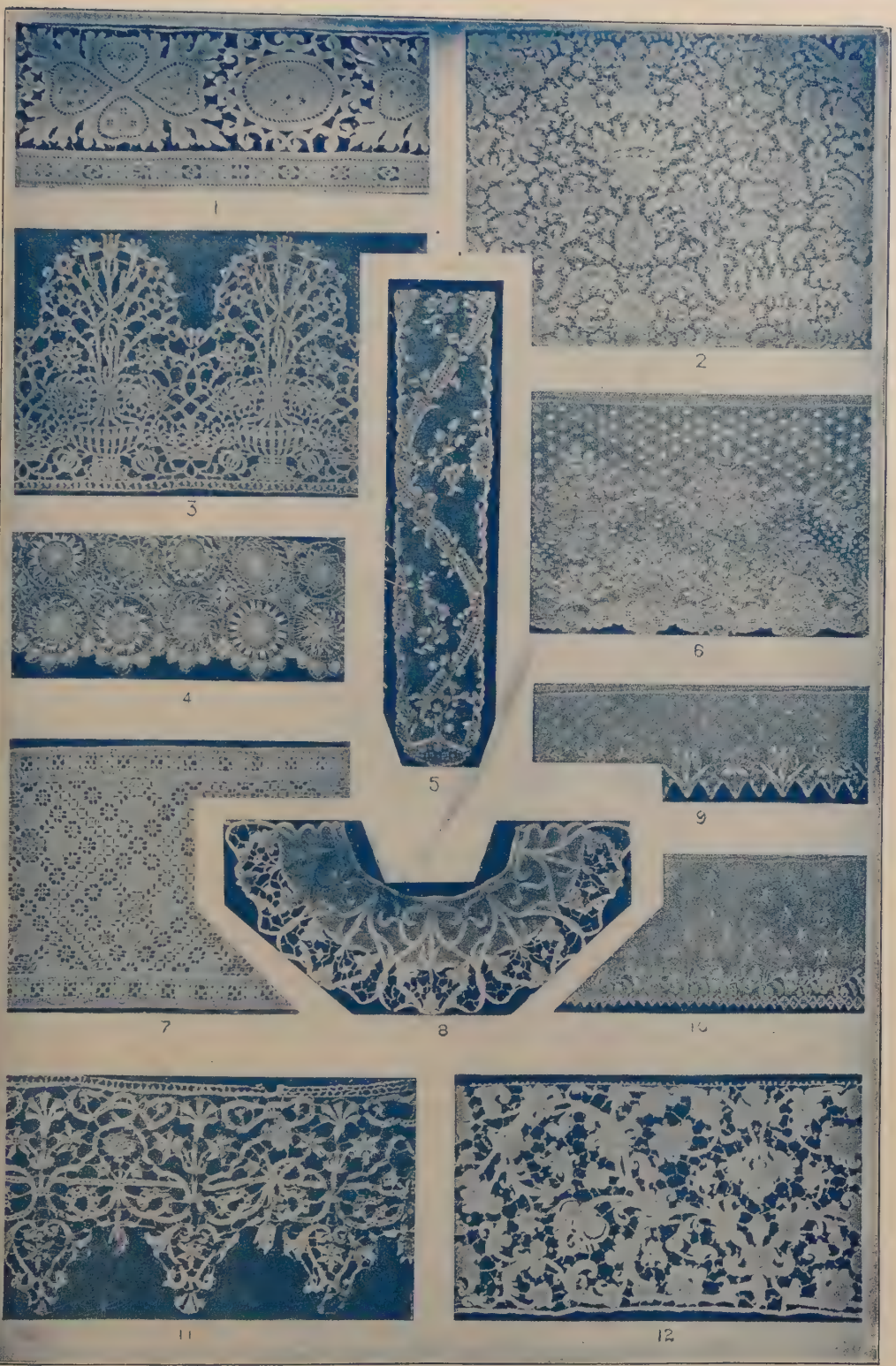
Labyrinth, lăb'ĭ-rĭnth, a structure having numerous intricate winding passages. The tradition remains of a famous labyrinth in the island of Crete, constructed by Daedalus. Once involved in its passages, it is said that no one could escape without falling prey to the monster Minotaur. It is thought that nothing of the sort existed, but that the legend was suggested by the many winding passages in a cavern of that island. The famous Egyptian labyrinth was a building in the Fayum, Egypt, half above and half below ground. It contained 3,000 rooms. It was constructed probably as a burial place. The Etruscans built a labyrinth at Clusium in Italy as a sepulcher for their king, Porsenna. Labyrinths or mazes formed of intricate winding hedgerows were formerly the delight of landscape gardeners. One of the most famous may still be seen at Hampton Court, near London. Bailey's *Cyclopedia* gives a cut of a celebrated labyrinth at Winchester, England. The labyrinth in the Fayum is described by Edwards:

> This platform, which measures 1,000 feet in length by 800 in breadth, represented the site of the labyrinth—that famous building of which it was said by Herodotus that it was "larger than all the temples of Greece put together, and more wonderful than the pyramids." The labyrinth was utterly destroyed by order of the Roman government some seventeen or eighteen centuries ago, and all that remains of its former magnificence is this platform, heaped six feet deep with thousands and tens of thousands of tons of limestone and granite chips. This tremendous destruction was undoubtedly wrought by order of the Roman government, and the people who smashed up and quarried out the most splendid building of the ancient world lived in that little town on the southwest corner of the platform. As they went on clearing the site they made use of it for a cemetery; and so, in course of time, the last vestiges of the labyrinth disappeared, and the place thereof became a city of the dead.

Lac, a resinous substance. It is produced chiefly on the twigs of the banyan tree by a scale insect allied to the cochineal insect and to the well known scale insect pests of the orchard. It is therefore a forest product of insect origin. The lac insect punctures the bark of the twig and feeds on the sap, all the while exuding a resin under cover of which it resides, lays its eggs, and dies. The young scramble out and fasten upon tender spots to repeat the history of the parent. In this way the twigs become completely encrusted with lac and are collected by the natives. The encrusted twigs are stick lac; broken from the twig, it is called seed lac; melted into thin plates, it is the shellac of commerce, much used in finishing woodwork. Genuine lac may be molded into tough, lustrous figures of extreme beauty. It is the material used by the Chinese and Japanese in their celebrated lacquer work. Their tea basins, chowchow bowls, and other articles, covered with a layer of lac, colored with vermilion, and molded into beautiful patterns, are veritable gems of art. Lac dye is obtained from the remnants of the insect in the stick lac. India produces about $9,000,000 worth of lac yearly. Half of the output is marketed in the United States. The price varies from $30 to $45 per hundredweight. See GUM; COCHINEAL; KAURI; PAINTING.

Lace, an open, ornamental fabric. It is not woven nor is it embroidery. Like knitting, it is a much more recent invention than weaving. Fine needlework was known to the Egyptian Pharaohs. Expensive embroidery, especially on the hems of garments, antedates history. Lacemaking as an art is thought to have grown out of needlework. Authorities admit that rude lace may have been produced during the twelfth century, but are of the opinion that nothing we should call lace was produced earlier than the discovery of America.

Hand-made lace is of two sorts,—point lace and pillow lace, or bobbin lace. Point lace is made with a needle, that is to say, with a point. The meshes are made with a single thread. Pillow lace is made with several threads, or even a hundred, each carried by a bobbin. Point lace early reached a high state of perfection in Venice. The artist first sketched his pattern on parchment. The parchment was then basted to a back of stout linen. Threads were laid on the lines of the patterns and tacked down by occasional stitches passing through both parchment and linen. The pattern was then filled in with thread and needle in a buttonhole stitch. After completion, the stitches holding the pattern threads were cut between the parchment and the linen, thus releasing the lace. Threads of flax, cotton, or silk, of a fineness almost beyond belief,



1, Italian point, 17th century; 2, Point de France, style of Louis XIV; 3, Spanish point, 17th century; 4, Teneriffe work, Paraguay, 19th century; 5, Argentan lace, style of Louis XV; 6, Brussels lace, 18th century; 7, Italian network, 16th and 17th centuries; 8, Silesian lace collar, 19th century; 9, Burano lace, 18th century; 10, Point d'Alençon, 18th century; 11, Spanish point; 17th century; 12, Relief point lace, 17th century.

LACE

can thus be worked into fairylike webs of exquisite patterns.

The Netherlands claim the invention of pillow lace. While the claim to more than development can hardly be allowed, it is certain that Flanders, which shares artistic honors also with north Italy, was noted early in the sixteenth century for delicate pillow lace of beautiful patterns. In making this sort of lace a pattern is drawn over parchment as before. The parchment is then fastened over a pillow, and the pattern is marked out by rows of pins inserted to half their length. As many threads as may be required are wound each on a bobbin. The lace maker then twists or braids the threads together, proceeding from pin to pin. The latter are used to keep the meshes in place. Groups of threads, whether twisted or plaited, may be combined and again separated at any pin according to the requirements of the pattern.

Laces are also named for the places in which they are made. Lille, Chantilly, Honiton, and Limerick or Irish lace are pillow laces. Brussels lace is of both kinds. Valenciennes lace is a pillow lace with a diamond shaped mesh. The threads are braided, that is to say, plaited. Mechlin, styled "the queen of laces," has meshes of a six-sided shape. Two sides are of four threads plaited four times. Four sides are of two twisted threads. Alençon, the most celebrated of French lace, is a point lace famous for exquisite floral designs. Honiton is an English pillow lace much favored by Queen Victoria and the ladies of her court. Since 1809 both point and pillow lace have been made successfully by machine. Nottingham, England, and Calais France, are centers of this industry. The laces of Plauen, Germany, are worked by machinery on a loose sort of flannel, or on chemically prepared muslin. The fabric is then plunged into a bath of strong chemicals that eat away the wool or muslin of the foundation, leaving the cotton or silk of the lace uninjured. The ordinary laces on sale in stores are machine made.

See KNITTING; EMBROIDERY.

Lachesis, lăk′ĕ-sĭs. See FATES.

Lachine, Quebec, an industrial suburb of the city of Montreal, is situated on Lake Saint Louis at its junction with the Lachine canal, and on the Canadian National and the Canadian Pacific railroads. The city has four miles of water front, and by means of the canal, built around the Lachine Rapids of the St. Lawrence, the city is the receiving and shipping point for all goods carried by water from Montreal to points west. The industrial life of Lachine, greatly aided by plentiful hydro-electric power, is represented by foundries, breweries, wire and wire rope factories, automobile, car, and boat-building plants, and manufactories of soap, window shades, copper ware, refrigerators, phonographs, and numerous other articles. The educational system is entirely modern, and includes a French and an English high school. This city was founded early in the seventeenth century by a group of persons who hoped to reach China via the St. Lawrence; whence, derisively, the name—La Chine. The town was burned and the inhabitants massacred by Iroquois Indians in 1689. In 1921 the population of Lachine was 15,404. See CANAL.

Lackawanna, N. Y., a manufacturing city, situated on the shores of Lake Erie and on four railroads, 5 miles south of Buffalo. In this city are large steel mills that employ from seven to nine thousand men, and produce structural and sheet steel. Besides the steel mills, there are bridge works, blast furnaces and coking plants. There are many fine buildings in the city, among them being St. Joseph's Orphan Asylum, and the Moses Taylor Hospital, Our Lady of Victory, a world-famous shrine, is here, also a fine park. The city was incorporated in 1909 and has a commission government. Population, 1920, 17,918.

Lacquer-Ware, articles of wood or metal ornamented by a coating of lacquer, or varnish containing lac. The Chinese, Japanese, and Burmese are skillful makers of lacquer-ware. The Japanese in particular excel in making fancy boxes for the toilet table, trays, napkin rings, placques, fans, brushes, combs, and other articles. The lac, which is obtained from the lac sumac, is dissolved in spring water. Gold, mercury, or some other pigment is added to

impart color. When applied to the surface of wood it gives a smooth, highly lustrous color. Gold and silver figures may be traced on a black background. Many rich combinations, as red and vermilion over black, are produced. The effect may be heightened by means of inlaid pearl, ivory, both plain and colored, and by small plates of polished metal. Cranes, scrolls, flowers, sprays, human figures, and a hundred other patterns are employed in high class work. As high as fifteen coats are applied, forming an incrustation in such a case, perhaps an eighth of an inch in thickness. Lacquer finish is so hard that it is difficult to scratch it, and it takes the most perfect finishing polish known. Although the term is applied usually to woodwork, metal work, particularly brass work, may be lacquered to advantage. The brass must be hot when the finishing material is applied. In addition to art work, ordinary articles of furniture are finished with a durable, hard ordinarily black lacquer, ornamented with gold designs. The wood of this sumac or lacquer tree, from which lac is obtained, takes a perfect finish and is much used in lacquer work.

La Crosse, a city in western Wisconsin, located on the Mississippi, where it is joined by the Black and the La Crosse Rivers. The leading industry is manufacturing of various sorts, the products include lumber, sash, doors and blinds, machinery, carriages, beer and ale, leather, cigars, boots and shoes, pearl buttons, crackers, rubber products, and flour. Several important railroads enter the city which does a large distributing business with western Wisconsin, southern Minnesota, and northern Iowa. The city has the Washburn Public Library of 20,000 volumes, three hospitals, a state asylum for the insane, a convent, several Roman Catholic and Lutheran schools and academies, and is the seat of the county buildings of La Crosse County. Its population in 1920 was 30,363.

Lacrosse, an Indian game of ball. It is played with a single ball. Each player carries a crosse, or slender bat. One end of it is bent into a curve and lashed with cords of rawhide, like a tennis racket. A goal is erected at each end of the grounds. The players, now usually twelve on a side, aim to drive or carry the ball through their opponents' goal. Rules are very similar to those observed in playing basket ball. No player must interfere with another. A small India rubber ball is used. It is carried or thrown with the crosse and must not be touched by the hand. A player is entitled to knock the ball out of another's crosse by striking it with his own, but in no other way. When any player sees that he is likely to be impeded, or likely to lose the ball, he is at liberty to throw it to another of his party who catches it with his crosse and in turn runs with it. In many respects lacrosse resembles the game of hockey. It is the national game of Canada. The Canadians learned it from the Indians. For an account of the original game, as played by the natives, the reader is referred to Parkman's volumes. In 1763 the Ojibway and Sac Indians played a game of lacrosse on the parade ground before the stockade of Mackinaw. The officers and soldiers of the garrison were scattered about, watching the game. The ball was driven, as if by accident, to the gate of the fort. The naked, leaping Indians, 200 or 300 in number, rushed in a body after the ball. They snatched tomahawks from beneath the blankets of the squaws, who were sitting around the gate of the stockade, and fell upon the unsuspecting garrison, cutting the soldiers off almost to a man. See HOCKEY; GAMES.

Ladd, George Trumbull (1842-1921), American psychologist and philosopher. His birth-place was Painesville, Ohio. After graduating from Western Reserve College, he spent two years in business and then entered Andover Theological Seminary, from which he received his degree in 1869. After holding pastorates in Edinburg, Ohio, and in Milwaukee, he was appointed to the chair of philosophy at Bowdoin College; in 1881 he was made professor of philosophy at Yale University, and later became Clarke professor of metaphysics and moral philosophy at the same institution.

Professor Ladd has won an enviable reputation as a lecturer. He has delivered two courses of lectures in Japan by invitation of the Imperial Educational Society of that country. The emperor of

Japan decorated him with the third degree of the Order of the Rising Sun in recognition of his services to the cause of education. He has lectured also before the University of Bombay, India, at Calcutta, and Benares. He founded the psychological laboratory at Yale, which is considered one of the best of its kind in the world. Beside his other work Professor Ladd has written many articles for periodicals and has published a large number of books, among which may be mentioned: *What is the Bible, Introduction to Philosophy, Outlines of Physiological Psychology, Philosophy of Knowledge, Essays on the Higher Education, Philosophy of Conduct.*

Ladies' Cloth, a species of fine, plain-woven flannel, slightly napped, and fulled in finishing to resemble broadcloth. It is used for women's gowns, children's coats, and a variety of domestic purposes. The name, ladies' cloth, was given formerly to light weight broadcloth designed for women's wear, but is now used exclusively to designate the flannel described above.

Ladoga, lăd'ō-ga, the largest lake in Europe. It is nearly as large as Lake Ontario. On a map it appears like a northeastern extension of the Gulf of Finland, of which, indeed, it was formerly a part. It is about 130 miles in length and seventy-five miles in breadth. It receives a number of streams which are connected by canals, making a network extending entirely around the lake. The water is clear and cool at all times, and is well stocked with fish. It is frozen over about 120 days in the year, or from December to April. The Neva, through which it empties into the Gulf of Finland, carries as much water as the Rhone and the Rhine combined.

Ladrones, la-drōnz', a group of islands in the Pacific Ocean about fifteen degrees north of the equator. The group was discovered by Magellan in his voyage of circumnavigation in 1521. He called them the Islands of the Lateen Sails. His crew named them the Ladrones, or Islands of Thieves, on account of the thieving habits of the natives. In 1898 Guam, the largest of these islands, was ceded to the United States. In 1899 Germany bought the remainder from Spain for about $4,000,000. The official name is Marianne Islands, in honor of a Spanish queen. The islands are of volcanic and coral origin. The total area is about 417 square miles. The vegetation is luxuriant, much resembling that of the Philippines. The breadfruit tree, and a cocoanut palm, rice, maize, sugar, tobacco, cotton, and bananas are found. It is said that breadfruit was first seen by white men in the Ladrones. There are only eighty-three white people in the islands. The inhabitants are chiefly Spanish-speaking Tagals from the Philippines.

Ladybugs, small, nearly hemispherical beetles. They are either red or yellow, with black spots; or else black, with white, red, or yellow spots. Most of them live on insects. The grubs of one species, called "wigglers," make themselves of great use to hop growers by devouring hop-lice. One sort, yellow with large black spots, makes free with squash and melon leaves. Children have long been friends of the ladybugs. They sing:

> Lady bug! Lady bug!
> Fly away home,
> Your house is on fire,
> Your children will burn.

It is hardly worth while to tell them that ladybugs are really beetles. A lady-bug or lady-bird, as it is sometimes called, has been imported into California for the service its larvae render in destroying the scale insect that infests fruit orchards. See BEETLES.

Lady of the Lake, The, a narrative poem by Sir Walter Scott published in 1810. The poem is in six cantos, each canto covering the events of one day in the action of the story, which is of a stirring and romantic nature. The verse is in rhymed couplets, with four accented syllables to the line; although each canto is introduced by a Spenserian stanza, and variety is produced by the introduction of songs in a different meter. The principal character in the story is Ellen Douglas who lived on an island in Lake Katrine, and from whom the poem is named. *The Lady of the Lake* is probably the most popular of Scott's long poems.

> The boat had touched this silver strand
> Just as the Hunter left his stand,
> And stood concealed amid the brake,
> To view this Lady of the Lake.
> The maiden paused, as if again
> She thought to catch the distant strain.

With head upraised, and look intent,
An eye and ear attentive bent,
And locks flung back, and lips apart,
Like monument of Grecian art,
In listening mood, she seemed to stand,
The guardian Naiad of the strand.

The title, "Lady of the Lake," in the Arthurian legends designates a very different person from Scott's Ellen Douglas. The sorceress Vivien is so called because her dwelling was in the midst of an enchanted lake which none could approach except by her wish. Tennyson, however, in *The Idylls of the King,* represents "the wily Vivien," who let her tongue

Rage like a fire among the noblest names,
Defaming and defacing, till she left
Not even Lancelot brave, nor Galahad pure,

as an entirely distinct character from the Lady of the Lake who gave Arthur her "huge cross-hilted sword," and who dwells

Down in a deep, calm, whatsoever storms
May shake the world.

See SCOTT; IDYLLS OF THE KING.

Lady's Slipper, *cypripedium,* or **Moccasin Flower,** a beautiful flowering plant of the orchid family, remarkable for an inflated lower lip. Lady's slippers are found wild in Europe, Asia, and both Americas, but not in Africa or Australia. There are six wild species in the United States northeast of a line from Minnesota to east Kansas, and thence to North Carolina. The smallest is the one-flowered, white kind, with a lip an inch in length on a stalk a hand's breadth in height. The largest is the showy lady's slipper—a royal flower with a pink, purple-spotted lip, two and one-half inches in length. Botanists recognize fifteen world species. The lady's slipper has been adopted as the state flower of Minnesota. The lady's slipper is the rarest of British wild flowers. A single species, a delicate, white, fragrant slipper, still lingers in a remote nook of Yorkshire. The few who know refuse to make its haunt public. See ORCHID.

La Farge, John (1835-1910), an American artist. He was born in New York City. He was educated for the law, but took William Hunt for a master and studied Japanese art. His most celebrated work is the Battle Window in Memorial Hall, Harvard. He painted altarpieces for St. Peter's and for the Church of the Ascension, both of New York. He decorated Trinity Church and the chancel of St. Thomas' Church, Boston. His reputation is that of a master of color, but not of composition.

Lafayette, lă-fā-yĕt′, **Marquis de** (1757-1834), a noted French soldier. He was born September 6, 1757, and died at Paris, May 20, 1834. He belonged to a distinguished French family of wealth, whose seat was in the vicinity of Auvergne. He was educated in Paris. He became an officer of the French guards in 1774. When the American Revolution came on he presented himself to the American commissioner, Deane, in Paris, and offered his services to the cause of liberty. Some difficulty arising as to transporation, he fitted out a ship at his own expense. When the king of France forbade its departure, he sent it to a port in Spain, and, eluding the guard that had been set over his movements, escaped to his ship and set sail with eleven companions, among others, Baron De Kalb. He arrived in Georgetown, South Carolina, April 14, 1777, and proceeded at once to Philadelphia. Brilliant prospects had been held up to him of high rank in the American army. Though disappointed in this respect, he offered his services promptly without pay or rank, asking only to serve as a volunteer. Washington received him into his official family. Lafayette was wounded at the battle of Brandywine; he was with Washington during the spring of 1778 at Valley Forge, and he fought at Monmouth. Though not a military genius, his bravery, enthusiasm, and social position were so valuable to the American cause that the Congress made him a major-general. He returned to France in 1779 and was instrumental in securing the coöperation of the French fleet and troops under Rochambeau. In 1780 he rejoined the American army. He was one of the court that condemned Major André to death. He had command of the Continental troops in the defense of Virginia against Cornwallis. He followed Cornwallis to Yorktown and kept guard over him until the arrival of Washington's troops. He was present at the surrender. At the close of the war he returned to France.

At the time of the French Revolution, despite his high birth and wealth, he was a liberal reformer. He was a member of the Assembly and was made commander-in-chief of the national guard of Paris and gave them the tri-colored cockade. He made an effort to save the lives of the king and queen. In spite of his services, he was not acceptable to the master spirits that controlled the city during the Reign of Terror. His property was confiscated. He escaped arrest and probable execution only by flight. He was held a prisoner of state by the Austrians for five years in the fortress of Olmütz, nor was he set free until Napoleon, who considered him a "noodle," caused his release. From this time on, he devoted himself to the management of an agricultural estate known as La Grange. While not a man of commanding ability, he was an ardent friend of liberty and a man of the strictest integrity.

Lafayette revisited the United States twice, first in 1784, and again in 1824, at the special invitation of President Monroe and Congress. He was received with every mark of respect, and revisited many of the scenes which he had known when a young officer. He visited the tomb of Washington at Mount Vernon. Congress voted him $200,000 and a township of land.

Lafayette, Ind., a manufacturing city and the county seat of Tippecanoe County, is 64 miles northwest of Indianapolis on the Wabash River. Near the city once stood a large Miami Indian village, on the site of which the French built, in 1720, Post Oniatanon—probably the first military post in the Wabash Valley and in Indiana. This post was surrendered to the English in 1760, and was taken from them by the Indians in the same year. The well-known Battle of Tippecanoe, in which General Harrison defeated the Indians, was fought about seven miles north of the city. Lafayette manufactures includes wire, soap, flour, carpets, paper, cardboard, strawboard and automobile accessories. It contains the Indiana State Soldier's Home, the Wabash Valley Sanitarium, a library, modern graded schools and a high school. The population was 22,486 in 1920.

La Follette, Robert Marion (1855-1925), an American statesman, born in Primrose, Wis. He studied law at the University of Wisconsin, and was admitted to the bar in Madison in 1880. In the same year, he was elected District Attorney of Dane County, on the Republican ticket. He held this position for four years, after which he engaged in private law practice. In 1887, he was elected to Congress and served for two terms, and here he became noted as an orator. He had much to do with the framing of the McKinley tariff bill. After his return to Madison, La Follette became an active leader of the younger element of the Republican party, and in 1900 was elected governor of the state. As governor, he was a strong advocate of a primary election law and a reform in the taxation of corporations. After being reelected twice, he resigned in order to become U. S. Senator from Wisconsin, and was serving his fourth term at the time of his death. Through his efforts, many beneficial measures have become laws, such as railroad rate classifications; direct election of United States senators; the regulation of telephone and telegraph rates; an eight hour day for government employes; woman suffrage. He was the candidate for President on the Progressive ticket in 1924.

La Fontaine, Jean de (1621-1695), a famous French writer, was born at Château-Thierry, in Champagne. He studied for the priesthood, but soon abandoned this for the study of literature, especially poetry. He soon began to write and publish poetry, the first of which he called *Contes et Nouvelles en Vers.* These were decidedly spicy, and created not a little attention. His versatility was shown by his becoming editor of a volume of religious verse, mystical in tone. After this he wrote some epic verse, which was followed by his *Fables,* on which his fame largely rests.

Lafontaine, Sir Louis Hippolyte (1807-1864), a Canadian jurist and statesman, was born at Boucherville, Lower Canada. He was educated at the College of Montreal, and after being admitted to the bar, rose to a prominent position in his profession, and finally entered politics, being returned to the Lower Canada Assembly in 1830. Though still quite young, Sir Louis was very able, and was soon

known as one of the hardest workers in the Dominion for the cause of responsible government. In 1838 Sir Louis was charged with treason as being in part responsible for the rebellion of 1837. No doubt these charges were a part of the machinations of his enemies, for they were proved to be utterly false and left no stain upon his name. Following the trial he went to England, later removed to France, but returned to Canada after a few years.

His return marked the opening of the struggle that culminated in the establishment of responsible government. Under the Act of Union, Sir Louis was elected to the joint assembly. After securing the leadership of the French-Canadians, he joined forces with Baldwin, who held a position in Upper Canada similar to that of himself in Lower Canada. The first Baldwin-Lafontaine ministry, formed in 1842, was forced out in 1844; but the two again formed a ministry in 1848, the one often referred to in Canada as the "great ministry," as marking the beginning of responsible Canadian government. After this accomplishment, Sir Louis gradually withdrew from public life, severing all connections in 1851. In 1853, however, he was appointed chief justice of Lower Canada, discharging with distinction the duties of this office until his death. He is recognized as one of the ablest jurists that Canada has produced.

Lagerlöf, Selma, (1858-), a noted Swedish novelist, the only woman who ever won the Nobel prize for literature and the first woman to be elected to the Swedish Academy. Miss Lagerlöf was born at Marbacka, Vermland; her father was an officer in the Swedish army and her mother came of a family that had produced several artists and clergymen. She was educated at Stockholm, and after graduation taught school for ten years. While still teaching, Miss Lagerlöf's first novel, *The Story of Gösta Berling,* was published, and met with immediate success. The literary field of Sweden was at this time flooded with introspective, pessimistic novels, and from these the fresh, vivid novel of Miss Lagerlöf was a welcome departure.

After a period of travel Miss Lagerlöf published the *Miracles of Anti-Christ,* a record of her impressions while in Italy. This work had a success almost greater than the first. In 1902 she was commissioned by the National Teacher's Association to write a textbook for use in the schools; she was asked to give in simple narrative form the folklore, geographical peculiarities, and flora and fauna of the various Swedish provinces. The result of her labors was *Nils Holgersson's Wonderful Journey Through Sweden,* a children's classic. Thereafter many honors were conferred upon her. In 1904 she was awarded the great gold medal of the Swedish Academy; she was given the degree of doctor of letters by Upsala University in 1907; the Nobel prize was awarded her in 1909; and five years later she was elected to the Academy. Other well known works by Miss Lagerlöf are *Jerusalem, The Girl from Marsh Croft, From a Swedish Homestead, Invisible Links, The Outcast* and *Zacharias Topelius.*

La Grippe. See INFLUENZA.

La Guayra, lä-gwī'rä, a seaport of Venezuela. It is situated on the Caribbean Sea. The harbor has been protected by a breakwater. A railway leads up to Caracas, five miles distant. The population is estimated at 11,000. La Guayra is the port of Caracas. About half of the foreign commerce is carried on at this port. American, British, French, Dutch, Spanish, German, and Italian ships call at the wharves. They bring cotton, silks, woolens, clothing, flour, rice, kerosene, wine, machinery, and hardware. They take away cargoes of coffee, cacao, rubber, hides, and cattle. Over $1,000,000 worth of gold is shipped yearly. Minor exports are pearls, asphalt, boxwood, and herons' feathers. See VENEZUELA.

Lake, a body of water surrounded by land. Lakes are classified, according to the kind of water they contain, into freshwater, salt, alkaline, brackish, etc. Salt lakes are of two kinds. Some were formerly fresh and have become salt because they have no outlet. As the water evaporates, it leaves behind salt and other minerals absorbed from the soil. Great Salt Lake and

the Dead Sea are of this nature. Other salt lakes are simply portions of the ocean imprisoned by the sinking of the basin in which they lie, or by the rising of a ridge cutting them off from the ocean. The Aral and the Caspian Seas were once a part of the Mediterranean. Fresh-water lakes are formed in various ways. The lakes of Switzerland lie in glacial valleys. Glacial deposits hold the water back just as a dam creates a pond. The waters of Lake Pepin, a widening of the Mississippi River, are held back by a ridge of silt brought in from Wisconsin by the Chippewa.

Many lakes occupy hollows scooped out by former glaciers. The Great Lakes of North America are examples of this sort. Crater Lake, in the Cascades of Oregon, occupies the crater of an extinct volcano. Its surface is 8,000 feet above sea level. It is ten miles in circumference. It is the deepest body of fresh water in America. An underlying stratum of rock salt or other soluble mineral is sometimes dissolved by water and carried away, causing the surface to fall in, thus creating a sink lake. Such lakes are not infrequent in limestone countries.

A river has a tendency to wear away the outer shore of a bend. In alluvial soil, therefore, the channel is likely to become a series of wide bends or loops. When a loop becomes pronounced, the current has a tendency to cut across the neck, thus straightening its course. The loop thus abandoned may be filled, in part, with silt, and be converted into a crooked or ox-bow lake. There are many such in the lower valley of the Mississippi. Most of the lakes of northern North America lie in low places caused by the uneven distribution of glacial drift. This is the case with nearly all prairie lakes.

Nature is busy at work filling up and destroying her lakes. The growth and accumulation of vegetable matter and the dust blown in by the winds are rapidly converting shallow lakes into marshes and marshes into meadows. Tributaries bring in quantities of silt. The Rhone has filled in the upper part of Lake Geneva in this way. The delta has advanced into the lake two miles within historical times. The outlet of a lake has a tendency also to cut away its barrier, thus lowering its surface. So pronounced is the effect of tributaries and outlets, that geographers say "streams are the mortal enemies of lakes."

The following are the larger lakes of the world. The area is expressed in square miles. The elevation is the altitude of the surface in feet above sea level. The minus sign indicates that the surface is below sea level. The depth is also expressed in feet.

	Area	Elevation	Greatest Depth, Feet
Aral Sea	26,900	163	225
Baikal	13,000	1,312	4,550
Caspian Sea	169,000	-85	2,500
Chad	10,000 to 30,000	900	...
Erie	9,960	573	210
Great Bear Lake	10,000	200	260
Great Salt Lake	2,000	4,218	50
Great Slave Lake	12,000	...	650
Huron	23,800	582	750
Ladoga	7,000	60	730
Manitoba	1,850	810	...
Michigan	22,450	582	870
Nicaragua	3,600	110	83
Nyassa	12,000	1,500	600
Ontario	7,240	247	738
Superior	31,200	602	1,008
Tanganyika	15,000	2,800	2,100
Titicaca	3,300	12,875	700
Victoria Nyanza	26,500	4,000	590+
Winnipeg	9,000	710	70

Lake, in the dyer's art, a pigment prepared usually by combining alum with a vegetable or animal dye. Alum is combined with cochineal to produce carmine lake; with logwood to produce purple; with madder to produce red; and with cobalt or indigo to produce blue. Lakes are used largely in printing calicoes and wall paper.

Lake Agassiz, a glacial lake once occupying the drainage basin of the Red River of the North. It was caused by a glacier from the north that dammed back the waters of the valley and prevented their flowing into Hudson Bay. The lake discharged its waters southward through the valley of the Minnesota into the Mississippi. At the period of its greatest size it occupied an area in Manitoba, North Dakota, and Minnesota almost equal to the drainage basin of the St. Lawrence. Its ancient bed is now one of the great wheat-producing plains of the world. A typical cross-section of the Dakota-Minnesota basin of Lake Agassiz

Swiss lake dwelling, Lake Zurich.

Reconstructed dwelling.

Pile dwelling, Nicobar, Bay of Bengal.

Pile dwelling, New Guinea.

LAKE DWELLINGS.

may be described as a plain forty miles wide sloping to the center at the rate of six feet to the mile. The center line is occupied by a "ditch" from twenty to thirty feet deep which serves as the channel of the Red River.

Lake Bonneville, a glacial lake at one time occupying the basin of northwestern Utah. It covered an area of nearly 20,000 square miles and had a depth in some places of 1,000 feet. It overflowed to the north during its second period of expansion, draining into the Shoshone River, whence it reached the Pacific. Through evaporation the lake became so shallow that only salt water, of little depth, remains, the largest area being the Great Salt Lake (which see).

Lake Charles, La., the parish seat of Calcasieu Parish, is on Lake Charles and on the Calcasieu River, 217 miles west of New Orleans. It is on several railroads and has deep water connections through the Intercoastal Canal. Lake Charles is in the center of a timber district that produces oak, cypress, ash, magnolia and long-leaf yellow pine, and borders on a great rice producing area. Oil, gas and salt are also products of this region and ten miles west of the city are some of the most valuable sulphur mines in the world. The city contains saw mills, rice mills, refineries and a chemical plant. It has a Carnegie library, country club, Federal building and one of the finest systems of public schools in the South. Lake Charles was settled in 1852, and was incorporated in 1857 under the name Charleston. It was incorporated again under the name of Lake Charles and chartered as a city in 1886. The commission form of government was adopted in 1913. Population 13,088.

Lake Dwellings, primitive houses built over water on piles. They are found within the shallow margins of both lakes and rivers where they have been built for protection at some distance from the shore. In South America the custom is prevalent in the Gulf of Maracaibo and in the waters of the lower Orinoco and the Amazon. The houses stand on tall poles driven into the soft mud of the bottoms and have sloping roofs which are thatched with reeds. The floors are made of split logs and are covered with matting. Each house has two rooms. The native reaches his hut by means of a dugout canoe. He climbs up by a ladder—a mere tree trunk with notches, knots, and branches. The piles are so well driven, the entire edifice so well built, that the structure defies storms and shows no evidence of shakiness though occupied by a large number of persons. The houses are grouped in villages and are connected by planks reaching from door to door.

Similar houses have been described by travelers in New Guinea, Borneo, Celebes, Caroline Islands, Central Africa, the Gold Coast, and elsewhere. Fishermen have been in the habit, until of late at least, of constructing houses of this sort, for occupancy during the fishing season, in the waters of the Black Sea and the Bosporus. Herodotus and other ancient writers mention dwellings of this sort. During the troublous times of the early centuries of the Christian era, in fact, as late as the sixteenth century, the petty chieftains of Ireland constructed lake fortresses as places of refuge. They were known as crannoges. Remains of similar strongholds are found in Scotland. It has been shown that pile houses were built extensively by the Celts, but the remains of a lake dwelling are not considered a proof of former Celtic occupancy.

South Central Europe was at one time peopled by a great number of lake dwellers. In Mecklenburg, Pomerania, Austria, Hungary, Italy, Savoy, and Switzerland, there are extensive traces of pile dwellings. The alpine lakes of this region have been studied with especial care. The sites of fifty villages have been found in Lake Neuchatel, thirty-two in Lake Constance, twenty-four in Lake Geneva, etc. These settlements were not only extensive, but they were laid out with regularity, and the buildings were erected with a degree of skill worthy of the builder of the modern Swiss chalet. They were laid out not infrequently in the form of parallelograms. One such settlement in Lake Constance was 2,100 feet long by 360 feet wide. Another in Lake Geneva was 1,200 feet long and 150 feet wide. Still another in the Lake of Bienne covered six acres of water. For convenient comparison, we may remember

IMPLEMENTS OF THE LAKE DWELLERS.

that a modern city block, 330 feet on a side, is considered large.

Occasionally the foundation of a lake settlement was a large platform of bundles of brush and limbs—fagots—piled up from the bottom and strengthened by stakes driven downward through the mass to hold it in shape; but ordinarily a forest of piles sharpened by fire or with primitive stone axes was driven into the bottom of the lake. As high as 100,000 piles were used for a single village. If the bottom was too soft and yielding to hold the piles, heaps of stones were piled around them. If the bottom was rocky, logs were laid down and holes were worked in them to receive the ends of the piles. The upper ends of the piles were trimmed into tenons. Cross-pieces to receive the floor were mortised on, or else the beams were laid on the tops of the piles and pegged down by wooden pins. A heavy wooden floor of split logs was laid on the beams.

On a huge platform of this sort the huts of the individual families were built. These huts were four-sided. The roofs were made of bark, straw, reeds, or rushes, and were supported on short posts or else on piles of unusual length left standing high for the purpose. The walls were made of willow or wattle work plastered with clay. There are no walls standing. No one knows whether the huts were provided with windows or what sort of doors were used. Fireplaces were built of slabs of stone, jointed with clay. As platforms are still standing, it is known that the huts varied in size. The largest discovered were twenty-seven feet long and twenty-two feet wide. They were about three feet apart.

Many of the settlements appear to have been reached by canoes. Others were provided with causeways built on long ricks of fagots piled like cordwood. In such villages there is evidence that domestic animals were stabled between the huts, possibly only in time of especial danger. Cattle, hogs, sheep, and goats were protected in this way. Remains of the dog and the horse have been found. Fire was the great danger to which the lake dwellers were exposed. On a dry, windy day we may imagine that fire would spread from thatch to thatch, destroying a settlement in a few minutes. In fact, no less than three platforms have been traced—the piles of the one penetrating the charred remains of its predecessors. Since their former occupancy a number of lakes have dried up into peat bogs, making it easy to search for antiquities. Ditchers have found many relics. The largest dugout canoe found is forty-three feet long and fifty-two inches wide.

The historical museums of the Swiss cities and universities, including those at Berne, Geneva, Lucerne, and Zurich, contain large collections of lake antiquities. A mere list of the articles found intermingled with charcoal on the sites of these old dwellings is interesting. Among these relics are stone axes lashed to handles of stag's horn and wood, flint saws gummed with asphalt into fir handles, and bone chisels—the rude implements with which they built their platforms and dug out their canoes. Clubs, flint knives, arrowheads, and fir longbows were evidently relied on in the chase and in battle. Barbed harpoons of stag's horn, bone fishhooks, and wooden floats for nets indicate the manner in which fish were caught. Bone awls, needles, scraping tools, and shoemakers' lasts were used in preparing and fashioning skins, moccasins, and fur clothing. Wooden spoons, platters, ladles, and tubs belonged evidently to the housewife. Remains are found showing that the food of the family consisted in part of fish, the flesh of domestic animals and such game as the bear, beaver, fox, elk, and bison. Charred grain and the flail indicate that the lake dweller raised wheat, barley, and millet. Cloth of various sorts of wool and linen indicate that felting and weaving were well understood. Pottery, well burned and well shaped, is abundant. The later settlements show that the working of bronze was understood. Crucibles or melting-pots of clay and horse dung have been found still retaining the dross of the metal. A great number of bronze swords, spear-heads, axheads, sickles, knives, chisels, hammers, an anvil, as well as rings, bracelets, and other articles of personal adornment have found their way into museums.

Lake of the Woods, a lake that forms a part of the boundary between Minnesota and the province of Ontario, Canada, and derives its name from the fact that it is

ringed about by forested hills and dotted with wooded islands. This lake is approximately 65 miles long and from 10 to 50 miles wide; but, owing to its irregularity, the shore line is about 300 miles long. The Rainy River enters from Rainy Lake at the south end, and from the north end flows the Winnipeg River. By the treaty drawn at the close of the Revolutionary War the lake was divided between Great Britain and the United States by a line running north-northwest from Rainy River.

Lake School, or **Lake Poets,** in English literature, a name given by the *Edinburgh Review* to a group of poets—Wordsworth, Coleridge, and Southey. The name was suggested because they resided in the lake district of England, a region of Cumberland, Westmoreland, and Lancashire beautified by Lake Windermere and other sheets of water. The name was given at first in derision, but it has become a name of honor.

Lalla Rookh, lăl'a-rook, the longest and most complete of the poetic works of Thomas Moore. It was published in 1817. It consists of four narrative poems, *The Veiled Prophet, The Fire Worshipers, Paradise and the Peri,* and *The Light of the Harem.* The four stories are represented as having been related to Lalla Rookh, an oriental princess, on her journey to meet her future husband. The story-teller, who, in the disguise of a minstrel, has helped to while away the tedium of the journey, proved to be the lover she is going to meet. *Paradise and the Peri* is the best of the four poems. The entire work is brilliant but somewhat wearisome. There is evidence of learning and of ingenuity on the part of the author. The versification is musical, and when considered in connection with the fact that Moore was a great favorite already, it is not to be wondered at that *Lalla Rookh,* this "confectionery composition," as it has been called, was applauded eagerly by the whole English world. For years it was regarded as a great work, and is still considered by many as unequaled by any other oriental poem in the English language. See MOORE, THOMAS.

Lamaism, lä'ma-ism, a religious belief of Asia. It is a mixture of Buddhism and other religions. Its adherents may be found from the Volga River eastward. It is the prevailing faith of Siberia, Manchuria, Mongolia, and Tibet. The spiritual head of the church, who is also monarch of Tibet, is the Dalai Lama or Ocean-wide Lama. His seat of power is the templed hill of Potala at the sacred city of Lhasa, Tibet. Buddha is held to be a great teacher of religious truth. Lamaism is chiefly a worship of saints with inferior honors to gods of heaven, earth, death and hell, and wealth, as well as demons innumerable. Public worship in the temples is conducted with music, prayer, reading, and singing. There are over 200 volumes of sacred writings wholly in the hands of the priesthood. Thus far the practice is that of Buddhism, but it is adapted to the people and their adherence is secured by concessions to the ancestral belief in witchcraft and magic, and the devil worship which Buddhism was unable to drive out wholly. In addition to these exercises the priests recite choruses, cast spells, and perform incantations. The faithful wear amulets, charms, and symbols, and keep count of their prayers by rosaries and prayer wheels. The common people are oppressed, not to say devoured, by swarms of religious devotees who live in monasteries and must be maintained by offerings of food. See TIBET; IDOLATRY.

Lamar, lä-mär', **Lucius Quintus Cincinnatus** (1825-1893), a noted American jurist. He was born in Putnam County, Georgia, September 1, 1825, and died at Macon, January 23, 1893. He was graduated from Emory College, Georgia, and was admitted to the bar at Macon in 1847. The outbreak of the Civil War found him in Congress as a representative of Mississippi. He resigned his seat. He drafted the ordinance of secession for Mississippi, and was lieutenant colonel of the first Confederate regiment enlisted in that state. At the close of the war he accepted a chair in the University of Mississippi, and was again sent to Congress. He was secretary of the interior during the first administration of Grover Cleveland. In 1888 he was appointed associate justice of the United States Supreme Court, which position he held until his death. He was considered a man of integrity and of large views. Two

of his best known addresses were eulogies on Charles Sumner and John C. Calhoun. The first of these is a landmark in the restoration of good feeling between North and South.

Lamarck, lä-mark′, **Jean Baptiste** (1744-1829), a noted French naturalist. He came of good family. He was educated at the Jesuit College of Amiens. He was intended for the church, but ran away to the army where he distinguished himself for bravery. A companion having lifted him by the head in sport, he was injured and was obliged to give up a military life. He went to Paris to study medicine, and supported himself as a banker's clerk. There he fell in with others of a scientific mind and took up the study of botany. He issued a manual of the flora of France. It was for some time the standard text for the identification of French plants, and secured for its author the honor of admission to the Academy of Sciences. He was favored by the friendship of Buffon. Botany and the classification of plants he soon left to his friend Jussieu. In 1792 he accepted a chair of zoölogy in the Royal Garden. In this line of work he became the predecessor of Cuvier. He introduced the plan of classifying animals according to whether they have or do not have a backbone. He coined the word "invertebrata," and did most of his work in this division of the animal kingdom. Lamarck also propounded the theory, since so ably advanced by Darwin and others, that the higher animals are developed from lower forms. He also taught that changes in animal structure have been brought about by efforts to meet the needs imposed by environment; for instance, that the long neck of the giraffe was developed by an effort, running through thousands of years, to reach the foliage of trees, and that the mole is practically blind because for generations it has made so little use of its eyes. In this he differed somewhat from the theory propounded later by Darwin who held that changes in organisms arose by variation and natural selection.

Lamartine, lä-mar-tēn′, **Alphonse** (1790-1869), a French historian. He was well educated and well connected. The family fled the country at the time of the French Revolution, but returned to favor at the downfall of Napoleon and the restoration of the Bourbons. Lamartine entered the Bourbon army and later saw service as a diplomat. Toward the close of the Bourbon reign he became democratic in his thinking. During the short interval between the Bourbons and Napoleon III he was minister of war and a man of influence in national matters. Though his views were broad he had little ability as a man of affairs and soon dropped out of politics. As a youth and a young man he wrote poetry. Political pamphlets engaged his attention. In 1847 his *History of the Girondists* appeared. Later works were a *History of the Revolution of 1848,* a *History of the Restoration,* a *History of Turkey,* and a *History of Russia,* all written from a democratic point of view. He held aloof from Louis Napoleon, yet, falling into poverty in his old age, accepted a pension, an act for which he was criticised by his republican friends. He did not live to see the Franco-Prussian War and the establishment of the French Republic.

Lamb, Charles (1775-1834), an English essayist. He was born in London, the son of a lawyer's clerk. He was the youngest of three children; the family was poor. When eight years old he was sent to the Blue-Coat School or Christ's Hospital. At fifteen a position was obtained for him in the South Sea office, the money he earned being acceptable at home. Three years later he found a similar but somewhat better position in the East India House. Here he worked for thirty-three years when he retired on a pension. Another cloud, darker than that brought by poverty, hung over the Lamb household. This was hereditary insanity. In a sudden and violent attack Lamb's sister Mary killed her mother. Mary had to be confined in an asylum where her reason returned, but attacks of insanity recurred occasionally as long as she lived. Charles, who had always been fond of reading, longed for a University course, but, instead, took his sister from the asylum, becoming responsible for her care, and henceforth devoted his life to her interests. When she was suffering from an attack of mania—was "ill," as her brother put it—she would have to be sent to the asylum. At other times the home was a peaceful and

measurably happy one. Mary was an intellectual and attractive woman; both brother and sister had many friends who used to gather in their pleasant home. Among these friends were Wordsworth, Coleridge, Southey, Leigh Hunt, De Quincey, and others. During the daytime, Lamb was employed at the office, but his evenings were given to his friends, his books, and his writings. He wrote for the periodicals of the day, occasionally in poetry, but more often in prose. *Tales from Shakespeare,* by Charles and Mary Lamb, are the plays of Shakespeare retold in prose for young readers. Mary wrote the comedies and Charles the tragedies. He also published *Specimens of Dramatic Poets Contemporary with Shakespeare.* The *Essays of Elia* appeared in the *London Magazine* and were published afterward in book form. They are written in quaint, old-fashioned language, and remind the reader of little else that has been written. He seems to have selected his subjects at random—anything that came into his mind. *Dream Children, Witches and Other Night Fears,* and *A Bachelor's Complaint of the Behavior of Married People,* are some of his subjects. The simple, genial humor of these essays is shown to best advantage in the *Dissertation on Roast Pig,* in which he tells how the Chinese learned to eat roast pig by the accidental burning of a bamboo hut. Lamb was not a great writer, but he is read with pleasure.

QUOTATIONS FROM LAMB.

Not if I know myself.

All, all are gone, the old familiar faces.

Much depends upon *when* and *where* you read a book. In the five or six impatient minutes before the dinner is quite ready, who would think of taking up the *Faery Queene* for a stop-gap?

Sentimentally I am disposed to harmony; but organically I am incapable of a tune.

I have indeed lived nominally fifty years, but deduct out of them the hours which I have lived to other people, and not to myself, and you will find me still a young fellow.

Returning to town in the stage-coach, which was filled with Mr. Gilman's guests, we stopped for a minute or two at Kentish Town. A woman asked the coachman, "Are you full inside?"

Upon which Lamb put his head through the window and said, "I am quite full inside; that last piece of pudding at Mr. Gilman's did the business for me.—*Autobiographical Recollections.*

SAID OF LAMB.

Lamb's memory will retain its fragrance as long as the best spice that ever was expended upon the Pharaohs.—*Southey.*

His work is small in quantity, but how rare and delicate it is in quality.—*Nicoll.*

The most original, most quaint, most simple, most touching, of all modern essayists.—*Knight.*

Lambeth Palace, the London residence of the Archbishop of Canterbury. It is situated in the parish and parliamentary borough of Lambeth, on the south side of the Thames, about a mile and a half southwest of St. Paul's. It lies up stream and across the Thames from Westminster Abbey. Lambeth was acquired by the archbishop in 1197. The present palace was begun soon after. It contains a fine library of 30,000 volumes, including the official records of the archbishop in forty volumes. The Lollards' Tower is a massive square keep.

Lammergeier, a large bird of prey, also called bearded vulture or bearded griffin. When the bird has attained full size it is of a shining brownish-black on the upper parts, with a white stripe along the shaft of each feather. The head is whitish, and the neck and under part of the body a dull yellow. It is the largest bird of prey in Europe. It measures nearly 4 feet high when sitting, nearly five feet in length, and its expanse of wing is from 9 to 10 feet. Its usual food consists of animals newly killed, but it will also eat carrion. It is found in Sardinia, the Pyrenees, the mountains of north Africa and the Himalayas.

Lamp, a cup-like receptacle in which oil is fed to a flame by means of a wick. The ancestry of the lamp is shown by the fact that the word lamp is from the Greek *lampas,* meaning a torch. In Greek mythology, Demeter went forth with a torch seeking her daughter. Psyche lets fall a drop of hot oil on Cupid and wakes him. The relative age of the two myths is easily inferred. The earlier lamps were plain, shallow, earthenware cups with a projection at one side for the wick and another on the opposite side to serve for a handle. The traditional "lamp of learning," figured on diplomas and college coats-of-arms, is of this sort. Similar lamps are still used by

the peasantry of the Apennines. The lamp played an important part in the religious festivals of the Greeks and Romans. Bronze lamps came into favor with the Greeks. The Erechtheum on the Acropolis had a gold lamp of exceptional beauty designed by no less an artist than the sculptor, Callimachus. When trimmed and filled it burned for a whole year.

From time immemorial cotton has been used for wicks, although any fibrous wick with capillary action will answer. The English peasant used a rush. Of all forms, the round, solid wick, formed like a cord or rope, is the poorest. Air reaches the outside only. The oil drawn up by the center of the wick has little chance at all and burns with a smoky flame, producing lamp-black. A flat wick is better. The entire flame is supplied with air, but the light thrown out is not uniform in all directions. Of the improvements in wick and burners that devised by Argand of Paris about 1780 is the most notable. The Argand burner consists essentially of two hollow brass cylinders or tubes, one within the other. The wick, also in the form of a hollow cylinder, passes up between these two. The wick presents a circular exterior, thus having an advantage over the flat wick in that it throws light in all directions. The inner tube feeds air to the inner surface of the wick; the supply of air to the outer surface is increased by a draft-creating chimney. One of the greatest improvements in the lamp was the invention of a mantle, similar to the gas mantle, that can be used with a kerosene lamp. This produces a light equal to that of gas or electricity.

The present generation is apt to think of kerosene oil only. People who are still in middle age can remember the introduction of this oil. Prior to the Civil War, whale oil, sperm oil, fish oil, and lard oil were used chiefly for lighting. Vegetable oils serve quite as well. The oil with which the wise virgins of the New Testament filled their lamps was doubtless olive oil. Cocoanut oil is used in tropical countries. Poppy oil, sesamum oil, and ground nut oil are used locally. Without doubt the oil of various North American nuts could be burned in lamps. In populous districts gas and electricity have superseded oil to a large extent, but the lamp is still one of the world's necessities.

See DAVY; ELECTRIC LIGHTING.

Lamp Black. See CHARCOAL.

Lampman, Archibald (1861-1899), a Canadian poet. He was born at Morpeth, Ontario, and was educated at Trinity College, Ontario, graduating in 1882. The next year he took a government position in the postoffice department of Ottawa. Many poems by him appeared in magazines of both the United States and Canada. *Among the Millet* and *Lyrics of Earth* are two collections of poems. The year following his death his *Complete Poems* was published with a memoir by Duncan Campbell Scott. Most of his poems deal with nature and life out of doors.

Lamprey, an eel-shaped creature. In the animal creation it ranks below the fishes. It is considered the lowest form of life having a brain incased in a skull. The skeleton is wholly cartilaginous. The Lamprey is without jaws, ribs, or legs. There are two dorsal fins. The skin is without scales. The mouth is formed for suction. The gill openings consist of a row of seven small, round holes along each side of the body. The lampreys of American and British coasts are from one to three feet long. They eat worms, snails, insect larvae, dead animals, and the like. They are parasitic also. They attach themselves by their sucker-like mouths just below the pectoral fin of the shad, sturgeon, shark, cod, halibut, mackerel, and other fishes. They suck the very lifeblood out of these fishes. There are several species of brook and river lampreys in American waters. They are not so injurious to food fishes. They are taken in the rivers of New England and salted down for winter use. The brook lampreys heap up a pile of pebbles in which to deposit their spawn. From a habit of holding to a stone with the mouth, to prevent being carried away by the current, the brook lamprey is known among boys as a stone sucker.

Lancaster, lăŋk'as-ter, a name prominent in English history. The county of Lancaster or Lancashire lies on the northwestern coast of England, between Chester and Westmoreland. The city of Lancaster is its capital, Liverpool the metropolis and chief seaport, and Manchester the chief

manufacturing town. The House of Lancaster is descended from John of Gaunt. It gave three kings to England, Henry IV, V, and VI. In the Wars of the Roses, the House of Lancaster wore the red rose. Among her other titles Queen Victoria was Duchess and Countess of Lancaster. See LIVERPOOL.

Lancaster, Ohio, an industrial city and the county seat of Fairfield County, is on the Hocking River and Hocking Canal, 32 miles south of Columbus. It is in the natural gas belt and in a rich agricultural region. It contains factories for the manufacture of shoes, lenses, gloves, flour, glass, wood-pulp machines and agricultural implements. It has a State Industrial School for Boys, Crawfis Institute, a library and a high school. The waterworks are municipally owned. Lancaster is the birthplace of Senator John Sherman and of General W. T. Sherman. Population in 1920, 14,706.

Lancaster, a manufacturing city in the southeastern part of Pennsylvania on the Conestoga Creek. The principal manufactures are tobacco which is handled in great quantities, confectionery, malt liquors, iron and steel goods, linoleum, combs, and cotton goods. There are two umbrella factories, one, the largest in the world. The city is in the midst of a region rich in tobacco and wheat, with extensive limestone deposits. A state normal school, four miles southwest, Franklin and Marshall Academy and Franklin and Marshall College within the city limits, and the Theological Seminary of the Reformed Church, including a preparatory school and a college as well, are located there. The city has three hospitals, libraries, several philanthropic institutions, and a fine public park. Here was the home of James Buchanan and of Thaddeus Stevens, to whose memory has been erected the Thaddeus Stevens Industrial Institute. The population in 1920 was 53,150.

Lancelot du Lac, or **Sir Lancelot,** in British romance, the most celebrated of King Arthur's Knights of the Round Table. The stories told of him are almost numberless. They are among the earliest of the Arthurian legends. Lancelot was the son of King Ban of Benwicke. In infancy he was stolen by the sorceress Vivien and brought up by her in her home in the magic lake. From this he received his cognomen, Lancelot du Lac, Lancelot of the Lake. When full grown, Vivien took Lancelot to King Arthur, who dubbed him knight. He had many adventures, in all of which he proved himself a valiant knight. He was false to the king, however, and by his guilty love for Queen Guinevere set in motion the chain of events which led to the destruction of Arthur's kingdom. Lancelot was loved by Elaine, whom he married, although he did not return her affection. Sir Galahad was their son. In some accounts, Lancelot spent his last days in repentance and the holy life of the cloister. In others, he was slain by Modred, the murderer of Arthur. Tennyson in *The Idylls of the King* represents Sir Lancelot as the bravest and noblest of Arthur's Knights, loved and trusted by Arthur and his entire court. He it was whom Arthur sent to Cameliard to bring Guinevere when her father's consent had been obtained to her marriage with the king. And it was at this time that the attachment was formed between Guinevere and Lancelot which led to the downfall of Arthur's hopes. Tennyson's *Elaine* is not the Elaine of the old legends. She never married Lancelot but loved him and died for love. See ARTHUR; ROUND TABLE; IDYLLS OF THE KING; GALAHAD.

Lanciani, län-chä'nē, **Rudolfo,** an eminent Italian archaeologist. He is a native of Rome, a graduate and a professor of the University of Rome. He is the leading authority on the buildings and institutions of ancient Rome. He is professor of topography and director of excavations. He is a member of several learned societies and is a lecturer of note. In 1887 he delivered a series of lectures at Harvard University. In 1888 he published *Ancient Rome in the Light of Recent Discoveries,* a remarkably clever and enticing exposition of the topography and edifices of the ancient city. A continuation of this work appeared in 1897 under the title of *The Ruins and Excavations of Ancient Rome.* Sr. Lanciani designed and built the new Archaeological Park at Rome; but one of his greatest

contributions to the history of the old city is a plan of Ancient Rome in 46 sheets, which, when fitted together, are 276 square feet in area. Among his recent books, the most noteworthy are *Pagan and Christian Rome, History of the Destruction of Ancient Rome* and *Golden Days of the Renaissance in Rome.*

Land and Sea Breezes. See WIND.

Land Crab. See CRAB.

Landes, a French word meaning heaths. It is applied to extensive tracts on the coast of the Bay of Biscay, between the Gironde and the Pyrenees. It is one of the least fertile districts in Europe. The soil is sandy. Vegetation is scanty, consisting chiefly of heath and dwarf shrubs. There are, however, considerable plantations of fir and cork trees. The inhabitants are an active, hospitable race, known as Gascons. The country is commonly tributary to Bordeaux. The inhabitants live chiefly by fishing, hunting, keeping of bees, swine, and sheep. The exports are charcoal, cork, turpentine, resin, and pitch. Wooden shoes are manufactured here. The Landes are remembered by the schoolboy as a region in which sheep are tended by peasants mounted on tall stilts, by means of which they get over the country with wonderful rapidity.

Landor, Walter Savage (1775-1864), an English writer. He was born in Warwickshire and died at Florence. He was educated at Rugby and Oxford, but did not take his degree, having been expelled for a breach of discipline. He inherited a large property from his father. As early as 1811 he married and settled at Florence, where much of his literary work was done. His subjects were chiefly ancient. His reputation rests mainly on *Imaginary Conversations* between distinguished persons, and on *Pericles and Aspasia,* a series of imaginary letters. His English is remarkable for purity and freedom from affectation.

SAYINGS.

A night of memories and of sighs.

A horrible compounder of historical facts.

The great man must have the intellect that puts in motion the intellect of others.

We are upon earth to learn what can be learnt upon earth, and not to speculate upon what can never be.

To let all flowers live freely, and all die,
Whene'er their Genius bids their souls depart,
Among their kindred in their native place.
I never pluck the rose; the violet's head
Hath shaken with my breath upon its bank,
And not reproached me; the ever-sacred cup
Of the pure lily hath between my hands
Felt safe, unsoiled, nor lost one grain of gold.

Landseer, Sir Edwin Henry (1802-1873), a celebrated English animal painter. He was born in London. He showed talent at a very early age. One of his productions now at Kensington bears, in his father's handwriting, the words "at the age of five." He made a faithful study of animals, dissecting such as were obtainable, until he became a master in his particular line. Horses and dogs were his favorite subjects. He was elected member of the Royal Academy in 1831 and was knighted in 1850. Outside of art, his life was uneventful. Some of his best known paintings are the *Hunted Stag, The Highland Shepherd's Chief Mourner, Tethered Rams, Monarch of the Glen,* and *The Stag at Bay.* Over 500 of Landseer's paintings are catalogued. See PAINTING.

Land's End, the southwestern extremity of England in Cornwall. It is a granite promontory from sixty to 100 feet in height. The name is the exact equivalent of Finistère, or "End of the Earth," found elsewhere on the western coast of Europe. A lighthouse on some low rocks marks the beginning of the English channel.

Landsthing, the upper house of the Danish Parliament. See DENMARK.

Land Tenure, a legal term, denoting the title by which land is held. American land titles rest on a government gift or sale. European monarchs granted lands in the New Worlds to individuals, to companies, and, by charter, to colonies. Individual proprietors, companies, and colonial authorities allotted, sold, and gave lands to settlers. When ceding territorial claims to the general government, some of the states, notably Connecticut, reserved lands and sold them later. The Congress of the United States paid off revolutionary claims by grants of land. Large tracts of land were sold outright at prices fixed by Congress, and thousands of quarter sections were sold to settlers and others at from $1.25 to $2.50 an acre. There were 182,-

886,310 acres of unoccupied public land in the United States on July 1, 1922.

Tracts granted to states for educational purposes are sold to individual purchasers.

In case of territory acquired by our government from another nation, the existent titles have been confirmed after settlement. Thus, in parts of the United States, as Louisiana, titles are based chiefly on grants from the French king. Many titles in California and the southwest rest on Spanish grants. Indian titles, that is to say, purchases made direct from the Indians, are considered worthless unless covered by a grant from the government. The descendants of Jonathan Carver have sought in vain to enforce Indian title to a tract of land now occupied by the city of St. Paul. William Penn bought his lands of the Indians; but his title, as we recognize it, came direct from the British crown. Although the chain of an American title may contain many curious links and be tied into complex kinks, it may be traced back in each case to the American Congress or to some European potentate or power.

The usual title in this country is fee simple, by which land belongs to the owner, his heirs, and assigns, forever. The owner may grant the use to another for a definite length of time far outrunning his own life even. He may give his land to another, he may sell, he may convey by will, or may leave it to be inherited by regular probate proceedings. Land in this country belongs to the owner absolutely, quite as much so as his gun, his horse, or his dog. To this absolute ownership there are certain qualifications, however: if the owner fail to pay his taxes the land may be taken over by the state; if the owner fail to occupy for a length of time determined by statute, and another occupy, the occupant gains title by what is called adverse possession. Under the theory of eminent domain the government may take possession of land required for public purposes. By paying a fair price the proper authorities may take any spot in a district for a schoolhouse, or any lot in a town for a public building. The owner may claim and collect proper compensation and proper allowance for damages, but he cannot prevent the proper authorities from taking his lands for a public road, street, or alley. The state may exercise this authority of eminent domain to grant a railroad a right of way even through the most populous region or city on the map, thereby often dividing valuable property into two sections.

English titles vary greatly. The feudal system developed peculiar titles. The most noted land tenure in England is known as entail. Ancient English law, confirmed by the Normans, authorized grants of land to "A and the heirs of his body." A statute of Westminster, 1285, sought to strengthen the law of entail. Stated briefly, an estate held in entail belongs to the owner only during his lifetime. He may allow another the use of it, but he may not divide it or sell it, or let it run down, or impair it. The owner is but an occupant in the interest of his heir and has no voice in determining who that heir shall be. The owner has no occasion to make a will, for the inheritance of the land is fixed by law and he cannot change it. Entail is considered cumbersome. Laws of entail have been abolished in all the colonies of England, and are not popular in England. Various methods, aided by Parliament, have been employed to get rid of entail, but considerable British real estate is still held under this sort of tenure. In English courts, the verb, alien, is used in the sense of to convey to another. Thus the authorities of Canada and Australia alien or alienate lands to settlers.

Many thoughtful writers hold that the state should not alienate land by permitting absolute ownership. Land is one of the necessities of life and should be allotted only to those who desire to occupy and use it. The carrying out of such a doctrine involves a return to a system of entail by which the state becomes the heir of all occupiers. Such a system promises certain advantages. It would put an end to all sales of land by private individuals; it would stop speculation in lands; and, in order to escape taxation, it would lead each possessor to be content with what he needs for his own use, leaving the rest for others. A system of this sort prevails in sections of Turkey.

See INHERITANCE; VIRGINIA; PENNSYLVANIA; WESTERN RESERVE; LAFAYETTE; FAIRFAX; HOMESTEAD ACT; IRRIGATION; PUBLIC LANDS.

Lang, Andrew (1844-1912), a Scottish author. He was born at Selkirk. He received his education at St. Andrew's and at Oxford. He wrote frequently for various periodicals and has published volumes on a variety of subjects. He has made prose translations of Greek classics, and has written several works on comparative mythology and religion. *Letters to Dead Authors* and *Letters on Literature* are interesting writings. Lang has produced a number of volumes of poetry. *Ballads and Lyrics of Old France, Ballads in Blue China, Rhymes à la Mode,* and *Ballads of Books are among them.* Perhaps Lang is as well known for his fairy tales as for his more ambitious writings. He has published *The Blue Fairy Book, The Red Fairy Book, The Pink Fairy Book, The Yellow Fairy Book,* and *The Green Fairy Book.*

Langevin, Sir Hector Louis (1826-1900), a French-Canadian statesman, was born at Quebec and educated at the Quebec Seminary. He entered a law office in 1846, and was called to the bar in 1850. Sir Hector took an active interest in public affairs while quite young, at the same time making a reputation for honorable practice in the legal world and as a litterateur. At the age of thirty-one he was elected mayor of Quebec, in which capacity he served until 1861. Three years later he became Queen's Counsel and solicitor-general for Lower Canada. In 1866 he was appointed Postmaster-General. Sir Hector was an ardent worker for confederation, and was sent to London in 1866 to assist in completing the organization of the Dominion of Canada. Following confederation, he was chosen Secretary of State in the first Dominion administration; and during the later years of his career was successively Minister of Public Works, Postmaster-General, and again Minister of Public Works. He served in the Dominion House of Commons from 1867 until his retirement from public life in 1896. Queen Victoria conferred upon him the title of Knight of the Order of Saint Michael and Saint George.

Langevin, Louis Philip Abelard (1855-1915), a Canadian Roman Catholic ecclesiastic, was born at Isidore, Quebec, and received instruction in theology at Saint Mary's College, Sulpician College and Grand Seminary. In 1882 he was ordained, and three years later was appointed to the chair of theology at the University of Ottawa. In 1893 he was made rector of Saint Mary's Church, at Winnipeg. During this time he took a particularly active part in the separate schools controversy that was carried on for many years in Manitoba. He attained his highest office in the Church in 1895, when he was consecrated archbishop of Saint Boniface.

Though Archbishop Langevin was but forty years old at the time of this appointment, his subsequent work showed that the confidence reposed in him was well founded.

Langlade, Charles Michel de (1729-1800), a French-Canadian leader and trader, was born at Michilimackinac. His mother and his wife were Indians, and owing to this face he was able to influence the Ottawa, Ojibwa, Potawatamie and other western tribes. He was the leader of the party that brought about the defeat of General Braddock when he advanced upon Fort Duquesne in 1755. His men appeared at the massacre of Fort William Henry in 1757, and he arranged an ambuscade around Wolfe's camp at Montmorency in 1759, this failing, however, for want of support. He was in Montcalm's army on the Plains of Abraham in 1759, and fought under Lévis the next spring at Sainte Foye. After the war Langlade was as loyal to the British as he had been previously to the French. He warned the frontier forts of Pontiac's plans and joined the army of General Burgoyne with a large following of Indians in 1777. The English government pensioned him for his services in the Revolutionary War and made him Indian superintendent with headquarters at Green Bay, where he is still spoken of reverently as "the father and the founder of Wisconsin."

Langland, William (1332-1400), an English author. He was probably born at Cleobury, Mortimer, and it is supposed that he went to school in the monastery at

Great Malvern. In 1362, when he was about thirty years old, he wrote the "A" text of *Piers the Plowman,* and there is no suggestion in this version of any intention on his part to continue or enlarge it. The "B" and "C" texts which have usually been attributed to him are now thought to be the work of other writers. Little is known of Langland. What has been asserted of his life has been gained from the poem itself, and since the authorship of the three versions has grown to be a disputed point, the foundation for many of these assertions has become practically nil. See PIERS PLOWMAN.

Langley, Samuel Pierpont (1834-1906), an American scientist noted for his work in astronomy and physics. He was born at Boston. After studying in the Boston Latin School, he went abroad for two years' study, returning to become an assistant professor of mathematics in the United States Naval Academy. In 1867 he was appointed director of Allegheny Observatory. Twenty years later he became secretary of the Smithsonian Institution. Professor Langley added greatly to the scientific knowledge on the subject of heat, and invented the bolometer, an instrument for measuring the sun's heat with great accuracy. His best-known work is in connection with the science of aviation. Though his flying-machine was not a success, he did a great deal to arouse interest in the subject in America.

Langton, Stephen, a celebrated archbishop of Canterbury. He died in 1228. He was a writer, a theologian, a biblical scholar, a historian, and a poet. He was educated at the University of Paris. King John opposed his installation as archbishop, and Langton retaliated by heading the movement that forced King John to sign Magna Charta at Runnymede. See MAGNA CHARTA.

Language, in general, any means by which facts, ideas, sentiments, or emotions are consciously communicated. An involuntary cry of pain, the bark of a dog, the wailing of a hungry infant, may all be heard and may attract our attention, but are not language. If, however, the cry is uttered consciously to call us, if the dog barks that we may hear and open the door for him; if the child cries, having learned that, if he makes noise enough, food will be given him, these sounds become, properly speaking, language. In the restricted sense in which language is a branch of scientific knowledge, it may be defined as human articulate speech. Specifically, *a language* is the whole body of articulate utterances by which the members of any particular community or portion of the human race communicate with each other.

Various theories have been advanced as to the origin of language. That it was a direct gift from the Creator, that it was a conscious invention of man, that it was a spontaneous product of human nature,—these are the three theories that have held sway. The last of these is the one now accepted. If we imagine a group of children who have not yet learned to speak as being excluded from companionship with persons who can talk, it is not difficult to suppose that, in the course of years, a crude language, beginning with gesticulation and the simplest sounds, would grow up among them. Just so did the languages of the world have their beginnings. What were the first spoken words, how they came to be used, can not be known, although scholars will never cease to speculate upon it. According to one theory the first words were imitations of natural sounds. Max Müller called this derisively the Bow-wow Theory. Others suggested that the earliest words must have been ejaculations called forth by strong emotions. Müller called this the Pooh-pooh Theory. Müller himself maintained a theory of typical sounds,—that an "instinct of speech" led to the first utterance, which was a "sonant sign" of the consciousness of some common act. When this theory was advanced, Müller's friends called it the Ding-dong Theory.

Whatever the truth concerning its beginning may be, it is certain that from the first gesture or sound by which one human being sought to communicate with another, language has been a thing of continuous growth. As increasing numbers caused people to push out in search of new homes, new dialects arose, which sometimes, after centuries of use, growth, and change, became distinct languages. There is no indication, however, that all languages had their

origin in one locality. In fact, evidence is in favor of the view that there were many different beginnings, from each of which different dialects and different languages arose.

For centuries languages were studied for practical ends, merely as a means of communication, or for the acquisition of knowledge through the medium of language. For less than a hundred years language has been regarded as a science proper; that is, a branch of knowledge in which it ceases to be a means and becomes itself the chief object of inquiry. The ultimate aim of the science of language, or philology, is to learn the origin, mode of growth, and relations to each other of various languages.

In 1816 Franz Bopp, a German writer, later a professor in the University of Berlin, published a comparative grammar of the Sanskrit, Greek, Latin, Persian, and German languages. This work laid the foundation for the comparative method of language study. Jacob Grimm at about the same time was at work on his *Deutsche Grammatik,* in which he treated the German language historically. Other names prominent as landmarks in the development of this science are those of Max Müller, William D. Whitney, Humboldt, Steinthal, and Schleicher.

The later and more detailed study of the science of language has proven many conclusions of earlier scholars to be groundless, and their classifications often inaccurate. The subject is one of such vast extent, involving details of such a complicated nature, that statements of a general or popular character are well nigh impossible. Consequently late works on the science of language are for the most part of interest to the advanced student only.

Various classifications of languages have been made which, although somewhat loose, and liable to change as investigations progress, are still of interest and value. Classified according to their structure, the thousand or more languages of the world fall into three groups:

1. Monosyllabic or isolated.
2. Agglutinative.
3. Inflective.

To the first class belong languages which are largely monosyllabic. The Chinese is the principal language of this class. It has no grammar, since a word becomes a part of speech by its position. For instance, the word *ta* may be noun, adjective, verb, or adverb, meaning respectively greatness, great, to be great, and greatly. In speaking the Chinese language, voice inflection is of importance in giving the proper meaning to a word.

The agglutinative languages form the largest of the three classes. To it belong those languages in which root words are united by juxtaposition only. That is, suffixes, prefixes, or infixes may be used; but in the new word the force of each syllable is still evident. For example in the word garrulity, we do not think of the meaning of the several parts that go to make up the word; in talk-a-tive-ness, which means the same as garrulity, the separate value of the syllables is noticeable. Talkativeness is an agglutinated word. Many English words once classed as compounds, as foreground, moonstruck, warehouse, are agglutinated words. In such expressions as Pussy-wants-a-corner, never-to-be-forgotten, penny-in-the-slot, jack-of-all-trades, we find words "glued" together after the agglutinative fashion. Bunyan in *Pilgrim's Progress* forms agglutinated words for many of his proper names as: Mr. Hategood, Mr. Facing-both-ways, Lord Fair-speech, Mr. Hold-the-world, Great-heart, Faint-heart, etc. Dickens does the same when he names Mr. Squeers' school Dotheboys Hall. In the humorous columns of our daily papers many proper names are formed in this fashion,—the Newlyweds, Mrs. Stay-at-home, Mr. Gotrocks, Mr. Henpeck, Mrs. Newrich. Mr. Get-rich-quick, etc. In languages of the agglutinative class, however, the words of this kind are not the exception, but are so prevalent as to form the most noticeable characteristic of the language. The various dialects of the American Indians are agglutinative, as may be seen from such Indian names as Hole-in-the-day and Man-afraid-of-his-shadow.

Inflective languages are those in which words undergo what is called internal change. Inflect means literally to bend, that is to change the form of, to vary. Nouns are varied by declension, verbs by conjugation, and this, not by the addition

of syllables merely, but by changes within the words themselves. For instance, man becomes men in the plural, foot becomes feet, give is changed to gave for the past tense, ride to rode, sing to sang, etc. Inflected languages contain both monosyllabic and agglutinated words, but besides these many words, the parts of which are so united or grown together as a result of internal changes that the separate elements do not stand out with distinct meaning. For instance, the word ostensible is made up of three words, *ob,* meaning before, *tenere,* meaning to stretch, and the suffix, *ble,* implying ability. In speaking the word, these parts and their separate meanings are neither recognized by the ear nor perceived by the mind.

In the historical study of languages, certain ones were found to be related closely. For instance, the root *sta,* signifying "stand," is found with slight variations in a number of distinct languages. When many such roots are found to be common to two or more languages, it is regarded as a proof that these languages sprang originally from some common stock or parent tongue. Such languages are said to belong to one *family.* Many such families exist, but only the more important have as yet received any degree of thorough investigation. These are:

1. The Indo-European, comprising most of the languages spoken in Europe, and some of those of Asia, including the great peninsula of India. Most of the dominant races of both continents, in ancient and modern times, have spoken languages belonging to this family.

2. The Semitic, including both Asiatic and African languages, many of which are now extinct.

Other families of somewhat less importance are the Hamitic, represented by the Egyptian and the Coptic; the Southeastern Asiatic, represented by the Chinese; the Ural-Altaic, or Turanian family, including the Turkey and Tartar languages, the Mongolian, and the languages of the Finns and Lapps; the South African; the Central African; and the American. The latter family includes the many dialects of the American Indians.

The family of special interest to the English-speaking student is the Indo-European, called also Indo-Germanic and Aryan. This family is divided into groups; the groups are subdivided into branches and perhaps sub-branches. The following classification, while not complete, will serve to locate the languages most important to the student of history and of literature:

INDO-EUROPEAN.

1. Indian or Sanskrit.
2. Iranian or Persian.
3. Hellenic or Greek.
4. Italic.
   - *a.* Latin.
   - *b.* Italian.
   - *c.* Spanish.
   - *d.* French.
5. Balto-Slavic.
6. Armenian.
7. Albanian.
8. Celtic.
9. Teutonic.
   - *a.* Gothic.
   - *b.* Norse or Scandinavian.
     - *a'.* Norse.
     - *b'.* Icelandic.
     - *c'.* Danish.
     - *d'.* Swedish.
   - *c.* West Teutonic.
     - *a'.* High German.
     - *b'.* Low German.
       - *a''.* English.
       - *b''.* Saxon.
       - *c''.* Frisian.
       - *d''.* Low Franconian.

Of the languages in this family, the most important are: Greek, Latin, Italian, Spanish, French, Scandinavian, German, and English.

In the ancient Greek and the Latin we find the highest development of ancient thought and culture. The ancient Greek is one of the most perfect of languages. Its words are full of significances; its phrases and idioms are elegant and forcible. Both in poetry and prose it is refined, musical, majestic. Many dialects were spoken,—the Aeolic, Ionic, Doric, and Attic being among them. In the course of centuries the language declined, and after the fall of Constantinople, 1453, ceased to be the medium of official communication. A dialect which had survived among the common people took the place of the ancient lan-

guage and is the foundation of the modern Greek.

The Latin language was formed, it is believed, from the Indo-European dialects. It was influenced largely by the Pelasgians from Asia, who settled in northern Italy a thousand years before Christ. As the Pelasgian was also one of the primitive sources of the Greek, the two languages, Greek and Latin, are related closely. The similarity was increased by later intercourse between the two nations. The Latin language, however, differed from the Greek just as the two nations differed. The Greeks were imaginative and speculative; the Romans, active, practical, dignified. As the Roman empire was extended the Roman language took the place of that of conquered nations, or else gradually affected these languages, so that we find nearly all European languages showing traces of Latin influence.

The Italian language, that is the literary language of Italy, is the Tuscan dialect, an outgrowth of the Latin as spoken by the common people. Florence was to the Tuscan tongue what London was to the language of Wessex. Such early Florentine writers as Dante and Petrarch gave to their dialect a national character. "Of this language, it may be said that for flexibility, copiousness, freedom of construction, and harmony and beauty of sound, it is the most perfect of all the idioms of the Neo-Latin or Romanic tongues."

The Spanish language is spoken in Spain, Mexico, and a large part of South America. It has its foundation in the vulgar or popular Latin, influenced powerfully by the conquest of the Visigoths, a Teutonic people, whose language so affected the development of Spanish that it is estimated that one-tenth of the words in the language are of Teutonic origin. The Iberian or Basque tongue of an earlier race which had inhabited Spain had its effect also, while the invasion of the Moors brought in many Arabic words which became incorporated in the language. Several dialects developed, but by the middle of the twelfth century that called the Castilian became a written language. By the beginning of the thirteenth century appeared the first epic in any Romanic language, *The Poem of the Cid.* From this time, Castilian or Spanish was the national language, although other dialects are still spoken. Portuguese was at one time a Spanish dialect, but has gained recognition as a distinct language.

Modern French, like Italian and Spanish, is a Romance language; that is, it is based on the Latin tongue. The Celtic and the Norman are the other elements of importance. Latin became the language of France, or Gaul—as it was called in ancient times, after Caesar's conquest of that country. The people of Gaul were called by many names. The Romans called them Galli. Welsch, Wallons, and Kelts or Celts were other names given them. In time they came to call themselves Romans, and their language, affected by the Latin, was called the Romance. Other elements had been introduced by northern invaders. By Charlemagne's time three distinct dialects existed. Charlemagne and his court used German. Latin was the written language, and the Romance was the dialect of the people. Gradually the Romance spoken in the south was more and more affected by the Latin; that of the northern tribes by the German. The two dialects were called *Langue d'oc* and *Langue d'oui. Langue d'oc* means language of *'oc'*, the word used in the south for 'yes'. *Langue d'oui* is language of *'oui'*, the northern word for 'yes'. After the Norman invasion the northern tribes—the Roman Wallons as they had come to be called—absorbed the language of the Normans, and Norman French was the result. By the twelfth century the *Langue d'oc* had come to be called the Provençal; the *Langue d'oui,* the French. The Provençal is still spoken by the common people in several provinces, but gradually the French became the established language of the nation. In the seventeenth century the French Academy fixed a standard of pure French, and, through its influence, the language gradually acquired a precision which has led to its being adopted as the court language in many countries.

The Scandinavian languages belong to the Teutonic group; they include the Icelandic, Danish, Swedish, and Norwegian. The Danish has been much affected by the German. The Icelandic is the Old Norse. Iceland was colonized by the Norwegians in the ninth century, and the Old Norse

language kept alive in this isolated island is almost unchanged after 1,000 years. The entire history of languages can scarcely show another circumstance so strange as this. Norwegian long existed only in the dialects of the peasantry; Danish being the official language of Norway. Björnson and Jonas Lie wrote in Norwegian and have done much to make it a literary language. The subject is exciting considerable interest among patriotic Norwegians, and effort is being made to give to the Norwegian its proper place as the official language of the nation. Swedish is the most musical of the Scandinavian dialects.

The High German, or German proper, has passed through three periods. The Old High German was spoken from the seventh to the eleventh century; Middle High German from the eleventh century until the Reformation, and the New High German, which was established by Luther, is at present the literary language of the country. "No modern language equals the German in its productiveness and its capacity of constant and homogeneous growth, in its aesthetical and philosophical character, and in its originality and independence."

So far we have considered languages whose growth has been of two different kinds. The Romance languages—Italian, Spanish and French—are based upon the Latin, with numerous elements from other tongues. The languages of the Teutonic group—the German and Scandinavian—are, for the most part, of homogeneous growth; that is, they have developed with little influence from outside. We come now to our own tongue which is the most composite of all composite languages.

To get any idea of the various elements entering into modern English, a few brief facts of England's history must be borne in mind. The earliest inhabitants, we learn from Julius Caesar, who invaded the island about 55 B. C., were Celts. The Romans, not under Caesar, but 100 years later, made another invasion and occupied the island for 300 years. Then came the conquest by the Teutonic tribes—the Angles, Saxons, and Jutes, who held undisputed sway until about the middle of the eighth century when the Danes began invading the land. These invasions continued at intervals for nearly three centuries, when for a time the Danes gained the ascendancy. Shortly after, in the eleventh century, the Norman conquest occurred, bringing in the Norman-French language, made up, as we have seen, from the Latin, Celtic, German, and Norman tongues. Thus we find the elements of the English language. Its real basis is the Anglo-Saxon, the language of the earliest Teutonic invaders, affected to a slight degree by the Celtic and retaining a few words left from the early Roman occupancy. This language, called the Anglo-Saxon or the Old English, was spoken until 1066, the time of the Norman conquest. During the eighth century, Christianity was brought to England by Roman missionaries, and the Latin used in the church service and by the priests in conversation and writing brought new words into the language. The extent of the Danish influence is difficult to determine since the Danish is also a Teutonic language. For 200 years after the Norman Conquest two distinct languages were spoken—the Anglo-Saxon and the Norman-French. By the middle of the thirteenth century they had begun to coalesce, and by the middle of the sixteenth century we have what is called usually Modern English. The language spoken during the period from the Norman Conquest to the middle of the sixteenth century is called Middle English. Scholars who are interested in investigating the inflectional and grammatical changes the language has undergone frequently divide its history into four or five periods instead of the three mentioned above.

The following classification of Semitic languages includes only the more important. There are in addition many dialects, of interest to the student of philology.

SEMITIC.—1. North Semitic:

- a. Phoenician.
- b. Hebrew.
- c. Babylono-Assyrian.
- d. Aramaic.

2. South Semitic:

- a. Arabic.
- b. Ethiopic.

A peculiarity of the Semitic languages is that the roots of words consist of three consonants each. These remain unchanged,

the variations being produced by the introduction of different vowels between these consonants. There are no compound words.

The Semitic languages are almost extinct. Hebrew is used as a written language to some extent. Arabic is the only one still spoken. It is the language of Mohammedanism, and as that religion spread, so the Arabic language spread until it became not alone the language of the learned, but the prevailing speech of southwestern Asia, and of eastern and northern Africa.

The Hebrew is a rich, euphonius language, more highly developed than any other of the Semitic tongues except the Arabic. Some slight conception of its scope and power may be gathered from the Old Testament Scriptures, which, with the exception of a few chapters, are written in Hebrew.

The only other branch of the Semitic family which is of special interest is the Aramaic, a term used sometimes to cover all the languages of the North Semitic group. As used here the Aramaic includes, among other dialects, the Syriac and the Chaldee. These dialects were spoken in Syria and in Palestine. Parts of the books of Daniel and Ezra, and a few lines in the book of Jeremiah are in Chaldee.

Before leaving the subject of language mention should be made of the international or universal languages. The object of such languages is not to supplant the various tongues of the many nations of the world, but to furnish an auxiliary language, a simple, easily acquired vehicle of communication which may be employed when necessary. A moment's reflection will convince any one of the vast benefits that would result were educated people of all nations able to speak together or to correspond without the aid of interpreters. Especially in national intercourse the advantage would be inestimable. Such a language must of necessity be artificial, that is, it cannot be, as are other languages, a matter of growth. It should be easy to acquire, regular, and without idiomatic expressions.

The first definite attempt at the formation of an artificial language was made about 1668. Volapük, the first to arouse general interest, was invented in 1878. Esperanto, invented about 1887, has made the most progress of any world speech which has been proposed. Ido and Universal are names of two others among the many languages which have been invented in recent years.—Mary Blanchard Murphy.

See VOLAPÜK; ESPERANTO; SANSKRIT.

Lanier, lăn'ĭ-er or la-nēr', **Sidney** (1842-1881), an American writer. He was born at Macon, Georgia, February 3, 1842. He died at Lynn, North Carolina, September 8, 1881. The Laniers were Huguenots. Sidney Lanier's mother was a Mary Anderson, of Virginia. His father was a respected lawyer. Both sides of the family were noted for talent in music and for love of poetry. Sidney Lanier was graduated at Oglethorpe College, Georgia. He served in the Confederate army as a private, and toward the close of the war spent some time in a Northern prison. After his release he was for two years a clerk in a hotel in Montgomery. Subsequently he studied law and entered his father's office. In 1879 he was appointed lecturer on English Literature at the Johns Hopkins University. Never strong, hardship in camp and prison had left him with feeble health, and he was obliged to seek outdoor life. His wife underwent privation and a hand-to-hand conflict with poverty with the utmost faithfulness. During a long fight with poor health and poverty Lanier kept up his studies and his writing. His first novel, *Tiger Lilies,* was written in the hotel above mentioned. His university lectures resulted in two critical volumes, *The Science of English Verse* and *The English Novel.* He edited *The Boys' Froissart, The Boys' King Arthur, The Boys' Percy,* and other works. His fame rests, however, on a volume of poems that ranks high. The best known are *The Song of the Chattahoochee, Corn, Tampa Robins,* and *The Marshes of Glynn.* In genius, Lanier is deemed a fit successor of Poe. His works are published by Charles Scribner's Sons.

Sidney Lanier and his verse deserve to be better known. His whole life was a gallant struggle with circumstance. Ten-

nyson, Longfellow, and Lowell had opportunity from the first. Lanier's course was a buffeting from start to finish. His body was weak; his education, so he said, farcical; Georgia was prostrate; his pocket was empty; his ambition fairly wasted him away. Like all true poets he lived near to nature.

The *Song of the Chattahoochee* is the song of a river. Wooed by bird, flower, tree, rock, and glen to "abide, abide," the river, filled with a sense of duty, into which we may read Lanier's own longings, glides, curves, dashes, frets, and brawls, and hurries away from fern and laurel to water the dusty plain. Here are a few liquid lines:

The hickory told me manifold
Fair tales of shade, the poplar tall
Wrought me her shadowy self to hold;
The chestnut, the oak, the walnut, the pine,
Overleaning, with flickering meaning and sign,
Said, Pass not, so cold, these manifold
    Deep shades of the hills of Habersham,
    These glades in the valleys of Hall.
    And oft in the hills of Habersham,
    And oft in the valleys of Hall,
The white quartz shone, and the smooth brook-stone
Did bar me of passage with friendly brawl,
And many a luminous jewel lone
—Crystals clear or a-cloud with mist,
Ruby, garnet, and amethyst—
Made lures with the lights of streaming stone.

Lansdowne, Henry Petty-Fitzmaurice, Third Marquis of (1780-1863), an English statesman. He studied at Eton and at Balliol College, Oxford, and at an early period entered upon a political career. From 1868 to 1872 he was Lord of the Treasury, from 1872 to 1874 Undersecretary of State for War, and in 1880 was appointed Undersecretary of State for India, from which latter position he resigned. In 1883 Lord Lansdowne became Governor-General of Canada, and held this position until 1888. During his incumbency many important events occurred, such as the completion of the Canadian Pacific Railway, a satisfactory conclusion of the North American fisheries controversy, and the suppression of the Riel Rebellion. In 1888 he left Canada, and as Viceroy went to India, remaining there until 1893. Lansdowne held many other important public positions, such as Secretary of State for War and Secretary of State for Foreign affairs. In 1915 he joined Mr. Asquith's Coalition Ministry without portfolio. In recent years he has taken little interest in public affairs, since he has been in poor health, but during the days of his public life he managed the affairs of Great Britain and Canada in such a way as to entitle him to an enduring place in history.

Lansing, Michigan, the capital of the state and the county seat of Ingham County, is situated at the junction of the Grand and Cedar rivers. It is located eighty-five miles from Detroit and sixty-four miles from Grand Rapids. The Grand Trunk, Michigan Central, the New York Central, the Pere Marquette and other railroads enter the city.

Lansing is picturesquely situated, the rivers being spanned by fine bridges, and the Grand River forms a belt around the business section. Industrially, the city is of great importance. Water power for manufacturing purposes is supplied by the rivers. The automobile industry is particularly important, others being the manufacture of farm implements, engines, furniture, wagons, wheelbarrows, trunks, artificial stone, flour, stoves, beet sugar, and silk and woolen goods.

There are some imposing public buildings here, such as the state capitol, which stands in a park of ten acres, and which has a library of over 110,000 volumes. Then there are the government buildings, the Elks' Home, the Masonic Temple, the Y. M. C. A. building, the Union depot and others of equal importance. Here is situated the state school for the blind, the state industrial school for boys, the state reform school and the state agricultural college, which is the oldest college devoted to the study of agriculture in the United States, and which has an experimental farm of 675 acres in connection with it. A United States Weather Bureau station is also here. There are some beautiful residences surrounded by fine old shade trees in Lansing, and a number of fine parks. The largest, Waverly Park and Pine Lake, are also summer resorts.

The first settlement on the site of Lansing was made in 1837. It became the state capital in 1847, was chartered as a

city in 1859 and rechartered in 1897. Lansing has had a steady growth in population, the figures for 1920 being 57,327.

Lansing, Robert (1864-), an American statesman born at Watertown, New York, was Secretary of State during an extremely trying period of America's history, 1915-1920. After graduation from Amherst College, he was admitted to the bar, in 1889, and was associated with his father in legal practice at Watertown for the subsequent eighteen years. He secured appointment as associate counsel for the United States on the Bering Sea Commission in 1892, serving later as counsel or agent before the Alaskan Boundary Tribunal, Hague Tribunal, Anglo-American Commission, and other bodies. Appointed counsellor of the Department of State in 1914, he succeeded W. J. Bryan as Secretary of State in 1915 after Mr. Bryan's resignation. Mr. Lansing's first official act was the signing of the second Lusitania note, unwillingness to sign which was the cause of Mr. Bryan's resignation.

Soon afterward Mr. Lansing was the subject of much criticism from those who were certain that he was likely to plunge the United States into war. The following years were filled with endless dealings with the allied European nations, largely regarding events on the high seas caused by the German submarine policy; with Mexico, regarding President Carranza's Pan-American plan for halting the shipment of food and munitions to all warring European nations; and with Japan regarding the continuation of the "open door" policy in China. Mr. Lansing's regime was much criticized and vigorously defended. As a member of the Allied Commission to Negotiate Peace, he, with Lord Robert Cecil and Colonel House, prepared a draft of the League of Nations. He disagreed with President Wilson regarding the incorporation of the League into the Peace Treaty. Yet he signed the Treaty, and urged upon the Senate its adoption as formulated. In 1920 he resigned as the result of a reprimand from President Wilson for having called a meeting of the members of the cabinet without the President's knowledge, although a number of such meetings had been called during the President's illness. Mr. Lansing then went into private practice at the Capital. He wrote *The Peace Negotiations, The Big Four and Others* and *Notes on Sovereignty.*

Laocoön, lā-ŏk'ō-ŏn, in Greek mythology, a brother of Anchises, a priest of Apollo. He married against the will of the god Apollo. He and his two sons were attacked by serpents and strangled while attempting to sacrifice a bull at the altar of Poseidon. Virgil uses the legend in his *Aeneid.* He represents that the priest and his sons were strangled at the altar because they had warned the Trojans against admitting the wooden horse within their walls. In 1506 a marble group was found under rubbish near the baths of Titus in Rome. It was recognized at once as a long lost group of Laocoon of which frequent mention had been made in literature. It is now preserved in the Vatican. It represents father and sons struggling in the folds of the serpents. It is composed of several pieces of marble joined together so skillfully as to seem one. It is considered the production of three sculptors who worked at Rhodes. The right arm of Laocoon was lacking. A dispute arose over its restoration. The "Laocoon Controversy," as it is known in literature, was the subject of several scores of doctors' theses. See SCULPTURE.

La Paz, a city of Bolivia, the seat of the department of La Paz. Latitude, 16° 30′ S. It is situated in the Andes, about forty-five miles by road southeast of Lake Titicaca, at an elevation 12,250 feet above sea level. Imposing cliffs rise 1,000 feet behind the town. The city was founded by the Spaniards in 1548; in 1605 it was made a bishopric. A cathedral founded in that year is one of the most imposing buildings in South America. Other buildings are the Jesuit Church of San Francisco, the University, and a palace occupied by the president when La Paz was the capital of Bolivia. The city is an important educational and church center. It enjoys a trade in copper, silver, tin, gold, grain, potatoes, sugar, coffee, and forest products, and is a distributing point for plantation, mining, grazing, Indian, and forest supplies. The streets are steep. A shaded promenade is maintained. The climate, despite the near-

ness to the equator is said to be cooler in summer, and, despite the elevation, warmer in winter, than Paris. Population in 1921 was about 107,000.

Lapis Lazuli, lā'pĭs lăz'ū-lī, a mineral much used as a gem and for decorative purposes. As a rule it is without cleavage. It is harder than glass. It consists of silica, alumina, iron, soda, carbon, and a trace of sulphur. The color is usually a deep blue, though it is occasionally violet, green, red, or even colorless. It occurs in small masses in crystalline limestone or in gneiss. It is found only in a few localities. The Old World supply is drawn chiefly from Asia—China, Tibet, Persia, Tartary, and the vicinity of Lake Baikal. The Andean region of Chile and Peru yields fine specimens. The exquisite blue pigment or artists' dye known as ultramarine blue is formed by pulverizing this mineral into a fine powder.

Lapithae, lăp'i-thē, in Greek legend, a race of Thessaly, descendants of Lapithes. Lapithes was a son of Apollo and a brother of Centaurus. Pirithous was the ruler of the Lapithae. On the occasion of his marriage to Hippodamia the Centaurs were invited to be present. One of them, Eurytion, became intoxicated and attempted to carry off the bride. The other Centaurs came to his assistance, while Pirithous and the Lapithae defended Hippodamia. The Lapithae were victorious. This contest was a favorite subject with sculptors and poets. The scene is represented on the Parthenon, the Theseum at Athens, the temple of Apollo at Basso, and on many vases. Raphael used the subject for a painting. See PIRITHOUS.

Laplace, lä-pläss', **Pierre Simon** (1749-1827), a French mathematician and astronomer. He was a native of Normandy. His father was a peasant farmer of small means. Laplace was educated by persons of means who recognized his genius. He gained a position first as a teacher of mathematics in a military school. He wrote a letter on the principles of mechanics to one in authority, and secured an appointment as professor of mathematics in the Military School of Paris. This position gave him opportunity for study and investigation. He is called sometimes the Newton of France. Though Laplace is considered one of the most brilliant scientists the world has known, his discoveries are of interest to the astronomer rather than to the public. He investigated, for instance, the irregularities in the movements of the planets. The attraction of planets for each other draws them out of their courses slightly. Through the influence of the one on the other, Jupiter and Saturn, for instance, leave their courses by half a degree. There were astronomers who predicted that sooner or later collisions would occur, and that our planetary system would go to ruin. Laplace, coöperating with a friend of nearly equal note, Lagrange, established the fact that, although the planets get out of their orbits slightly, they accomplish their trips with mechanical regularity. Even the variations can be computed with exactness, and are completed with fixed cycles of years. The perturbations, as they are called, of Jupiter and Saturn run through a period of 913 years, at the end of which time these planets are exactly where they began. A similar period of disturbances between Uranus and Neptune is completed in each 4,000 years. The sum and substance of Laplace's announcement is that the world may rest easy. There is no danger of a clash between the different members of the solar system. His greatest work, *Celestial Mechanics,* appeared in 1799-1825. It has been translated into English. The fame of Laplace as a scholar brought him an appointment as minister of the interior. His incapacity was such that Napoleon dismissed him at the end of six weeks with the remark that he was trying to run France on the principles of infinitesimal calculus. He was a member of the French Academy. His life was free from the poverty and worry that has overtaken many eminent scholars. His name is associated prominently with a theory of the solar system known as the Nebular Hypothesis. See ASTRONOMY; NEBULAR HYPOTHESIS.

Lapland, an indefinite territory, the home of the Lapps. It occupies the northern portions of Norway, Sweden, Finland, and Russia proper as far east as Archangel. Owing to the influence of the Gulf Stream, the climate is milder than that of the cor-

responding region in North America. The soil is unproductive. Small fields of rye are raised, but the greater part of this vast stretch is covered with the mosses on which reindeer feed.

The Lapps are related to the Finns. They are considered a fringe of the great Mongolian invasion that swept over eastern Europe in early days. They have neighbored with the Scandinavians so long that they have been converted to the Lutheran religion, and have taken over many Norwegian and Swedish words into their language. Otherwise, however, their natural speech is unintelligible to a European. A few are members of the Greek Church.

There has been intermingling of blood. Some villages are quite Scandinavian in appearance. The genuine Lapps are a short race—the shortest people in Europe. Even the men seldom exceed five feet four inches in stature. They are described as a squatty, bowlegged people, not, however, without agility, especially in the winter season. They are of a yellowish complexion. The hair is black and straight; the beard is scanty. The Lapp has black, oblique eyes, a flat, stubby nose, a broad mouth and high cheek bones. Men and women dress much alike. They wear woolen clothing with reindeer boots, reindeer trousers, and coat of the same material.

On the Norwegian coast there are villages of Lapp fishermen, but, like the Tartars, to whom they are probably distantly related, the great majority of the inhabitants live a wandering life, following their herds of tame reindeer. In the winter season they live in log or stone huts made tight with moss and covered usually with earth, in which grasses and other plants take root, giving the habitation the appearance of a low, grassy mound. In summer they live in portable tents consisting of slender poles covered with heavy woolen cloth. The Lapp tent has much the appearance of the North American wigwam. As might be expected from people who live in a cold country without facilities for bathing, they are far from tidy. They are said to wash their faces only on holiday occasions. Cooking is performed usually in an open kettle suspended from the roof above, in which an aperture is made for the escape of smoke. Babies are swung to and fro in a contrivance not unlike a large shoe, likewise suspended from the ceiling. One side of the room is reserved for housework, the other provides sleeping accommodations. Beds are made of moss or twigs covered with reindeer skins. The members of the family sleep together without removing their clothing. In case of very cold weather they have tanned robes for covering.

The typical Lapp has no occupation except that of tending his flock. In this he is aided by a shrewd, wolfish cur that understands its business quite as well as the shepherd dog of Scotland. The Lapp is the only person who has ever succeeded in domesticating an animal of the deer kind. His ambition in life is to own a large flock of reindeer. The Lapps build their houses in the uplands where the reindeer prefer to feed a considerable part of the year. They have inclosures into which the herds are driven once a day. The man of the house lassoes the female reindeer and ties them up while the women milk. A reindeer yields about a teacup full of exceedingly rich, strong milk, from which rank butter and strong cheese are made.

As stated, the reindeer live on moss which grows without cultivation. A deep snow seems to be no hindrance to their feeding. They paw holes with their front feet, as a dog digs a burrow, until they reach the moss. A herd of deer feeding in a deep snow presents a peculiar appearance. Not infrequently nothing is visible but the tips of their tails at the top of the snow burrows. In the summer season the deer break away and make for the coast. The reason for this migration is not understood, but it is impossible to stop them. The most that the Lapp and his dogs can do is to direct their course to some desired portion of the coast. When the time of migration comes, the entire family packs up and follows the deer. Each Lapp punches the ears of his deer with his own private mark, which, like the brand used by our Western cattlemen, is registered with the government.

Scattered here and there throughout the entire territory are lonely government chapels to which the Lapps repair for weddings or to attend service. In the winter

time they harness their favorite reindeer to sledges and think nothing of going 100 miles to church. The sledge is a long, narnow affair, shaped not unlike an Indian's canoe. The harness of the reindeer consists of a band around its neck with a thong running between its legs to the prow of the sled. The breaking of the reindeer begins at the age of three. It requires two years to tame him thoroughly.

At certain seasons of the year the Lapps journey to trading stations to exchange eiderdown, reindeer horns, hides, and meat, as well as grouse, capercailzie, and other game, for silver buttons, jewelry, clocks, articles of finery, coffee, sugar, and, we regret to say, a rye whiskey of the vilest sort. It is not long since writers estimated the total number of Lapps at 30,000. Like the North American Indians, they have diminished steadily, until, at the present time, there are not above half that many.

See REINDEER; MIDNIGHT SUN; FINLAND.

La Plata, lä-plä'tä, a river of South America. The name is Spanish, signifying the broad. It is really a tidal estuary into which the united waters of the Uruguay and the Parana flow. It is 143 miles wide at its mouth and is about 190 miles long. It discharges a volume of water comparable with that of the Amazon. Harbors are few. That of Montevideo is the only safe anchorage on the northern shore. Buenos Ayres and La Plata are on the Argentine shore. It is a magnificent ocean gateway, rivaling the St. Lawrence.

La Plata, a city of Argentina. It is situated on the wide La Plata, here an estuary of the ocean, about twenty-four miles southeast of Buenos Ayres. When the capital of Argentina was located definitely in Buenos Ayres, then the seat of the province of that name, the local legislature of the province decided to found a new city for a provincial capital which should be independent of the national capital. A sandy shore was selected. The city was founded in 1882. The streets were laid off in squares, intersected by diagonals, after the manner of Washington, D. C. Forty million dollars were expended in provincial buildings. A cathedral, museum, astronomical observatory, and other institutional buildings were erected. The growth of the city has been phenomenal. It is now the focus of the Argentine railway system, and is the chief port of the republic. Enormous elevators, warehouses, and wharves are busy transferring meats, hides, wheat, butter, wool, ores, forest products, linseed, and fruits, to steamships. Ships come to La Plata and Buenos Ayres not only from the United States, but from the United Kingdom, Germany, Belgium, Spain, France, and Italy, laden with hundreds of millions of dollars worth of foods, beverages, oils, textiles paper, iron, carriages, hardware, pottery, electrical apparatus, and chemicals, needed by the cities, ranches, farms, and forests of the republic. Population, 90,436.

LaPorte, Ind., the county seat of La Porte County, is a manufacturing city that has also attained some popularity as a summer resort. It is 59 miles east of Chicago, and 12 miles from Lake Michigan, on three railroads. The natural beauty of the surrounding country, with its lakes and woods, attracts many people to La Porte each year. It contains manufactories of furniture, baby carriages, woolen goods, bicycles, oil pull tractors, threshing machines, meat slicing machines, pianos and brooms. Here are located St. Rose's Academy, the Ruth Sabin Home, fine public schools, including a $400,000 high school, and a library. Population in 1920, 15,158.

Laprairie, the county town of Laprairie County, Quebec, is on the south shore of the St. Lawrence near the Lachine Rapids, six miles south of Montreal, with which city Laprairie has ferry connection. It is also served by the Canadian National Railways. From Laprairie ran the first railroad in British North America, 1832. The city contains brick yards, agricultural implement factories, a textile mill, butter factories, foundries and a tomato cannery. It has public schools, an academic school, a library and two churches. Laprairie has lately become a popular summer resort. The population was 2,158 in 1921.

Lapwing, a bird of the plover or snipe family. The common European lapwing, known also as the pewit, from its cry, has four toes and a long black crest. The upper parts of the male are lustrous with green, violet, and purplish tints. It is

rather smaller than a pigeon. It inhabits the marshy districts of England. The eggs are esteemed a luxury and command a fancy price in the London market, where they are sold as plover's eggs. This is the bird of which Tennyson says:

> In the spring, the wanton lapwing
> Gets himself another crest.

Laramie, Wyo., the county seat of Albany County, is on the Laramie River, at an altitude of 7,150 feet, 57 miles northwest of Cheyenne, the state capital. It is the center of an extensive agricultural, stock raising and scenic district, and is near mineral beds that yield gold, silver, lead, copper, graphite and antimony. It contains railroad and machine shops, cement and plaster mills, rolling mills and stock yards. It is the seat of the University of Wyoming, of a state fish hatchery and of an agricultural experiment station. It has good public schools and a Carnegie library. The population in 1920 was 6,301.

Larceny, in law, the unlawful taking and carrying away of property, with the intention of depriving the rightful owner of it. At common law, larceny is divided into grand larceny and petit larceny, according to the value of the goods, chattels or property carried away, but the goods must have some value, in order to constitute larceny. The goods, also, must be actually carried way from the premises, either with the intent of trespassing upon the property of another, or of depriving him of some property rightfully belonging to him.

Possession on the part of an owner is necessary in order to prosecute successfully an action for trespass, for there can be no larceny from an owner not in possession of the property carried away. So, courts have decided that a common carrier is not guilty of larceny if he steals a bundle which has been entrusted to his care, for not the owner, but the carrier, has the legal possession of the property. Having possession of the goods, the carrier cannot commit trespass. But it is also urged that if he tears the bundle open and steals goods contained therein, he is guilty of larceny, for by breaking open the bundle, he loses possession of the goods and terminates his contract with the owner. A servant or employe entrusted with goods, if he steals same, is guilty of larceny, since he has no legal possession of such goods.

To constitute larceny, the taking away of goods must be against an owner's consent, and if such consent is obtained through fraud, an action for larceny will not lie, but will be interpreted as taking goods under false pretenses.

At common law, the rules of procedure on this question have been materially changed both in England and the United States, and the taking of goods with intent to feloniously defraud, as in the embezzlement of money which has been placed in one's hands for some rightful purpose, now constitutes larceny.

Larch, a genus of coniferous trees comprising less than twelve species. They are natives of the colder parts of the northern hemisphere. The common European larch grows from the mountains of southern Europe and central Asia to the far north. It is of rapid growth and reaches the height of 100 feet in some instances. It is often planted as a windbreak, and for ornamental purposes. The American larch, also called tamarack and hackmatack, grows in swamp or peaty soils. It is straight, tall, and has a gradually tapering trunk with nearly horizontal branches. It is used for telegraph and telephone poles, for railroad ties, and in ship-building. Its bark, which contains tannin, is sometimes used for making leather. It is found throughout North America.

Larcom, Lucy (1826-1893), an American writer. She was born at Beverly, Massachusetts, and died at Boston, April 17, 1893. When a girl she worked in a cotton mill at Lowell, Massachusetts. Her first writing was in the form of contributions to the *Lowell Offering,* a magazine conducted by the operatives in the mills. She attracted Whittier's attention. She studied, taught, and wrote. She became the editor of *Our Young Folks,* a Boston magazine since absorbed by *St. Nicholas.* She wrote many short stories and published several slender volumes of verse, bearing *Childhood Songs, Wild Roses of Cape Ann,* and other titles. She wrote her own life in *A New England Girlhood.* Her

best known poem is perhaps *Hannah at the Window Binding Shoes,* long a favorite with the Hutchinson family of singers. Nothing has been written that more perfectly pictures the pathos of life in a fishing village.

Laredo, Texas, the county seat of Webb County, is 154 miles southwest of San Antonio, on the Rio Grande River, opposite Nuevo Laredo, Old Mexico. It is in the center of a fertile agricultural district irigated from the Rio Grande; live stock is extensively raised in the district; and considerable coal deposits are worked. In the city are manufactured furniture, brooms, mattresses, foundry and machine hop products, bricks and crackers. It contains an old Spanish cathedral, a Federal building, Laredo Seminary, Ursuline Academy and Convent; and just west of the city is a military post, Fort McIntosh. Laredo was settled by Spaniards in 1767. Oil has been discovered near Laredo; shallow wells produce over 500 barrels daily. The International & Great Northern, the National of Mexico and the Rio Grande & Eagle Pass railroads serve the city.

Laredo was settled by Spaniards in 1767. For a long time it was a frontier town of Mexico. It was incorporated in 1848. A mission for native Indians was established here quite a long time before the first settlement by the Spaniards. The population, 1920, was 35,000.

Lares, lā′rēz, in Roman mythology, a class of household deities. They are usually mentioned with the Penates; but the Penates were gods originally, while the Lares were regarded as the deified spirits of mortals. In each family the Lares were supposed to be the souls of ancestors who watched over the welfare of their descendants. There were also public Lares, two in number, who guarded the unity of the state. If not respected and propitiated, the Lares, both of the home and of the state, were powerful to bring evil upon offenders.

Lark, a family of small birds. There are over 100 Old World species—trim, alert birds with sparrow-like plumage. The name is erroneously applied to several more or less similar birds, as to our meadow lark, which is really a starling. The common skylark, celebrated for its powers of flight and its song poured out while soaring and floating at great heights, is a modest brown bird of the open fields. It nests in open commons in the shelter of a tuft of grass or a clod, and feeds on seeds, insects, and worms. It breeds throughout Europe and temperate Asia, migrating southward for the winter, but is known chiefly as the English skylark. Attempts have been made to introduce it in Long Island and elsewhere.

The American representatives of the family are the horned larks which, like their British relatives, have a long hind toe and walk with a graceful, elastic step or a swift run, instead of hopping like a sparrow. A tuft or horn of black feathers on each side of the head, and a sulphur-yellow forehead and throat, are sufficient to attract attention to the horned shore lark. It breeds in Northern Canada and winters in New England and southward. The prairie horned lark is a trifle smaller. The yellow spots are paler, or even white. It is a bird of the western plain, but has extended its nesting range into the Upper Mississippi Valley and eastward. It is a winter resident, associating with snowbirds. If an adult sparrow-like bird runs familiarly along the road in front of one and flies ahead from time to time without showing the white outside tail feathers of the vesper sparrow, the chances are good that it is a prairie horned lark. Look for the short black tufts on its head. It is not the meadow lark.

Larkspur, a flower, akin to the columbine, belonging to the buttercup family. The larkspur differs from the columbine in having only one petal provided with a spur. The name comes from the shape of the spur, which resembles the rear toe of a lark. There are over sixty species in the north temperate zone. On account of their hardihood and ease of cultivation, they are garden favorites. The color is commonly blue. By the change of stamens into petals double varieties have been produced. Certain species of Rocky mountain larkspur are poisonous to stock, and cause serious losses on the ranges. See LOCO WEED; ACONITE; BUTTERCUP.

La Rochelle, lä-rō-shĕl′. See ROCHELLE.

Larva, the first stage of an insect after hatching from the egg. Various names have been given them, as caterpillar, grub, or maggot. They are in general worm-like in form. From this stage the larva passes into the next, known as the pupa or chrysalis, which in turn changes to the adult. See INSECTS.

Laryngoscope, an instrument for examining the larynx. It consists of a mirror placed in the throat upon which a beam of light is thrown from another mirror usually on the forehead of the observer. Thus is the larynx illuminated and its reflected image can be clearly seen in the mirror in the throat. It is of use in treating diseases of the throat and in studying the mechanism of the voice, and in examinations of the nasal cavities.

Larynx, a cartilaginous box placed between the windpipe and the tongue, and inclosing membranous bands — the vocal cords. All air taken into or sent out of the lungs must pass through this box; and it is the vibrations of the elastic bands in this box that produce voice. In ordinary breathing the vocal cords are separated so that when the air passes through them no sound is produced. In talking, singing, or shouting, the cords are drawn inward and backward by the cartilage — muscles—so that a very narrow slit is formed, and the air, in passing, is forced out. This sets the edges of the bands in vibration, and the vibrations produce sound. The loudness of the sound made depends upon the force with which the air is driven between the cords. The pitch of the sound depends upon the tension of the cords. If these are stretched, the pitch is high; if relaxed, the pitch is low. The quality of the voice—whether harsh or sweet—depends upon several conditions, such as the form and condition of the throat, nose, and mouth cavities, and the general health of the body. Articulate speech is the result of changes in the resonance cavities, mouth, throat, and nose, and in the modifications produced in the voice by the lips, tongue, and teeth. The larynx of a child is smaller proportionately than that of an adult. At the age of twelve to fifteen years the larynx widens and the cords lengthen. This change causes a deepening of the tone of the voice. Clearness and quality of voice can be improved by practice. See ADAM'S APPLE.

La Salle, la-säl', **Robert Cavalier de** (1643-1687), a French explorer of North America. He was a native of Rouen. He was educated by the Jesuits. He went to Canada as a fur trader and established a post at Lachine above Montreal. He explored the Ohio Valley thinking that stream might lead to China, the land of trade and wealth. Marquette and Joliet demonstrated that the Ohio joined the Mississippi and flowed in the direction of the Gulf of Mexico. La Salle then sailed for France and laid before the government a vast project for taking possession of the Mississippi Valley. He was ennobled and was given authority to explore and trade. He was granted a large tract of land.

On his return to Canada he rebuilt Fort Frontenac, established a post above Niagara Falls, and built a ship for the navigation of the Great Lakes. In 1679 he sailed for Green Bay, Wisconsin. He sent back his ship, the Griffin, laden with rich furs for his creditors at Montreal. He proceeded in bark canoes as far as Lake Peoria, where he left his subordinates to continue the exploration while he paid a hasty visit to Frontenac. Here he learned that the Griffin had gone down to the bottom of the lake, and that a ship sent from France with supplies had foundered at sea. Nothing daunted, he returned to his companions and descended the Mississippi to its mouth, where he built a fort. He called the country Louisiana in honor of the French king. He then ascended the Mississippi in canoes and returned by way of the Great Lakes to Montreal. Revisiting France, he set out in 1684 for the mouth of the Mississippi with four ships and 280 men. His commander, Beaujeu, was headstrong and, missing the mouth of the river, sailed on to Matagorda Bay. Before this mistake could be rectified the colonists lost most of their supplies. La Salle and the captain parted. Only a remnant stayed by La Salle. Instead of returning at once to the Mississippi, he built a fort in Texas which he called Fort St. Louis.

Here he spent two years in vain explorations. In 1687 the number of survivors was reduced to thirty-seven. The party set out to find the Mississippi and intended to make their way to Canada. La Salle was shot from ambush by some of his own companions who had a grudge against him. A few of his followers reached Canada.

La Salle was, no doubt, one of the ablest men sent by France to the New World. His views were large. Whether the misfortune that dogged his steps was due to want of attention to details or to the worthless character of his associates is an open question. His name has been preserved in a thriving city and county of Illinois.

See JOLIET; HENNEPIN.

La Salle, Illinois, an industrial and commercial city situated at the head of navigation on the Illinois River, 99 miles southwest of Chicago. It is the western terminus of the Illinois and Michigan Canal, and is served by three railroads and several interurban lines. La Salle is the center of an extensive coal field, and fire clay, silica sand and cement rock are found in the vicinity. The principal products of the numerous manufactories are sulphuric acid, spelter and sheet zinc, while of lesser importance are machinery, sheet metal tools, bricks, clocks, hydraulic and Portland cement, acid phosphate and plows. The city contains a Federal building, good primary and secondary schools and a Carnegie library. In 1920 the population was 13,050. There is a large foreign element in La Salle with Poles and Hungarians predominating. The area of the city is three square miles.

Lassa, or Lhasa, las'sa, the chief city of Tibet. The name signifies "God's Ground." It is the metropolis and sacred city of the Buddhist world. It is situated on a small plain surrounded by barren mountains. There are four defiles by which caravans may reach the city. The houses of the poor people are of gray and sun dried brick; those of the wealthy are of stone or brick. One of the suburbs is of houses constructed chiefly of the horns of sheep and oxen set in clay mortar. It is difficult to gain a detailed knowledge of the city, as foreigners are regarded with jealousy, and are not allowed to approach the city except under rare circumstances.

See LAMAISM.

Lassalle, lä-säl', **Ferdinand** (1825-1864), a German socialist. He was born at Breslau and died at Geneva. Like Carl Marx, he was of Jewish ancestry. His father was a merchant and aimed to bring his son up in the same calling. Ferdinand studied at Breslau and at Berlin. His first liking was the study of philosophy. His first publication was an examination of Heraclitus from the Hegelian point of view. In Berlin, Lassalle moved in so-called good society. Humboldt called him a prodigy — a *Wunderkind.* The poet Heine regarded him as a young man of remarkable endowments. In Berlin he formed an attachment for a Countess Hatzfeldt and undertook a bit of knight errantry in her behalf, nothing less than the theft from a room in a hotel at Cologne of a casket of jewels and a bond given by the husband of the countess to another woman. Lassalle himself did not engage in the act, but he instigated it and narrowly escaped imprisonment.

Like other young men of a Byronic turn of mind, he was engaged in fomenting the disturbance of 1848. The authorities of Düsseldorf put him behind the bars for a year. In consequence he was forbidden to return to Berlin. In 1859 he entered the capital city in the disguise of a carter, and sent his old friend Humboldt to the king to obtain permission to remain. In this same year he published a noteworthy pamphlet on the Italian war and the mission of France. He pointed out the service France was doing north Germany by weakening Austria in Italy, and outlined the program which was later carried out by Bismarck and Von Moltke.

In 1861 Lassalle published a work in two volumes, the *System of Acquired Rights,* in which he pointed out the gradual and systematic manner in which privilege and an extra chance in life have been acquired by a small part of the population. From this time on he flung himself into the work that has given him place in the memory of man—the organization of workingmen into a political party. He founded the German Labor Union. He taught that labor passes through three successive

stages—serfdom, wage earning, and association. He published some twenty pamphlets in support of his theories. In all this Lassalle was merely a brilliant disciple of Carl Marx with a knack of getting his ideas before the people. He is regarded by many as the founder of the German Social Democratic Party—a party which in 1871 cast 12,400 votes and elected two members of the Reichstag and in 1911 cast 4,250,401 votes and elected one hundred and ten members.

The end of Lassalle was not heroic. He was an exquisite in personal habits, not averse to wine suppers and a fashionable life. In the round of social pleasures he met a young woman of social standing for whom he conceived a passion which was reciprocated. The young people met again at a hotel on the Rigi, Switzerland. They decided on a romantic marriage. Her father, a prosaic Bavarian diplomatist then resident in Geneva, shut the young lady up in her room and arranged a marriage for her with a Wallachian count. Lassalle, having exhausted every resource to see the young woman, sent a challenge to her father and another to her betrothed. The latter accepted and Lassalle fell mortally wounded. In spite of this inglorious end Lassalle was given the funeral of a martyr, and is held almost in reverence by a large body of adherents.

Here I stand; I cannot do otherwise; God help me; Amen! Even if it lead to my mortal death. . . . I cannot act otherwise. An agitation of laborers exists; they must have theoretical knowledge, they must have a watchword given them. They shall have it, even if it cost the head. . . .

The alliance of science and the laborers, these two opposite poles of society, when once they shall have met and embraced each other, will crush all the impediments of culture within their brazen arms. This is the object for which I am determined to spend my life so long as there is any breath in me. . . .

Let others be happy! In natures like mine it is enough to go on struggling . . . to waste away one's own heart, and yet to appear smiling while death is gnawing away at one's inmost soul. —*Quotations from Lassalle.*

Last Rose of Summer See MOORE, THOMAS.

Las Vegas, N. M., the county seat of San Miguel County, is 132 miles northeast of Albuquerque, on the Gallinas River and on the Atchison, Topeka & Santa Fe Railroad. Though usually regarded as one city, there are here two separate cities; one, largely Mexican, on the west bank of the river, the other, incorporated under the name East Las Vegas, on the east bank. The city is on a plain about 6,500 feet above sea level, and is the center of a large agricultural and stock raising region. It is an important market for wool and live stock. Six miles from the city are the Las Vegas Hot Springs and a popular health resort, 6,765 feet above sea level. The climate here is equable, and there are medicinal hot springs to the number of 40. Las Vegas contains flour mills, brick yards, a wool scouring establishment and a tie-preserving works. New Mexico Normal University and the New Mexico Insane Asylum are here, as well as public schools and a Carnegie library. Population in 1920, 4,237.

Lathrop, Julia Clifford (1858-), a well known American social worker who in 1912 was appointed by President Taft chief of the Children's Bureau, a division of the Department of Labor. She was born at Rockford, Ill., and was graduated from Vassar College in 1880. For years after 1880 she was asociated with Miss Jane Addams at Hull House, Chicago, and was very active in working for improvement of baneful social conditions. Appointed a member of the Illinois State Board of Charities in 1893, Miss Lathrop resigned in 1901 as a protest aginst political control of state institutions. She was one of the founders of the Illinois Society for Mental Hygiene, and is an ardent worker for the improvement of conditions in hospitals for the insane. Miss Lathrop visited Europe several times for the purpose of studying foreign methods in the care of insane persons and of children. She assisted in establishing the Chicago Juvenile Court and the Chicago School of Civics and Philanthropy. Her appointment as chief of the Children's Bureau made Miss Lathorp the first woman ever placed in charge of a Federal bureau.

Latimer, Hugh (1490?-1555), English reformer. He was educated at Cambridge and took part in the stirring times

of the English Reformation. His experience illustrates well the intolerance of the times. First he narrowly escaped the vengeance of the Roman Church for preaching against its abuses; then he was thrown into prison for not coming out squarely for the new English Church; finally, in the reign of the Catholic Mary, he was bound to the stake and burned as a heretic. His sermons, two volumes of which are extant, now seem plain, witty talks to the people on practical reforms and earnest living.

Latin, the language of the Romans. Modern Italian, French, Spanish, and Portuguese are descended in part from the Latin. Many Latin words appear in these languages unchanged. The countries of South America and Central America, including Mexico, in which Spanish is the official language, are called sometimes Latin America. Latin is an inflected language. The uses of a noun are indicated by changes in the ending. When used as the subject of a verb, father is spelled *pater;* when it is the object of a verb, it is spelled *patrem;* while father used as a possessive is spelled *patris.* Similar changes take place in the endings of adjectives. *Bonus pater,* for instance, means a good father, but a good mother is written *bona mater,* the ending *us* being masculine, *a* feminine. Similar changes take place in the formation of a verb. *Audio* means I hear, *audivi,* I have heard.

It is altogether unlikely that inflected Latin, as it appears in literature, was ever spoken by more than a mere fraction of the people of the Roman Empire. The peasantry, without doubt, spoke dialects, in which the inflections, that is to say, the changes in the termination of the words, had never been developed or had been dropped. Undoubtedly Virgil and Cicero had difficulty in understanding the various Latin dialects heard, if not in Rome, certainly in the various provinces of Italy. Scholars are of the opinion that in some of the mountain districts of the Apennines there are communities whose language, passing for Italian, differs little from the language spoken in their villages during the reign of Augustus.

The Christian fathers of the western church naturally spoke and wrote Latin. The literature of the early Roman church was written in Latin, and services were conducted in that language. As the church was the custodian of learning, Latin was the language of the schools in western Europe until the time of the Reformation. Schoolboys everywhere from Italy to Scotland read Latin and were taught Latin grammar. Before the invention of printing nearly all manuscripts in the western world were written in Latin. University professors lectured in Latin. The first book printed was a Latin Bible. The Jesuit Colleges of France were noted for the excellence of their Latin. Calvin, Luther, Erasmus, Melanchthon, and Knox, the reformers, were educated in schoolrooms in which Latin was spoken as French and German are spoken today. James I of England, who caused the Bible to be translated into the English tongue, was taught to read and speak Latin by George Buchanan, a famous Scottish schoolmaster. Latin was the language of diplomacy until the end of the seventeenth century. Milton was employed by Cromwell in the day of the Commonwealth to translate state papers received from other countries and to write replies in Latin. He was known as the Latin secretary.

Seeing that textbooks were written in Latin, and that teachers imparted their instruction in that tongue, it is not strange that four-fifths of the borrowed words contained in an English dictionary are of Roman origin. The language still receives more attention in European schools than it does in America. According to recent statistics, a little over half of the students in American high schools and academies pursue the subject of Latin. The percentage of Latin students is higher in the corresponding schools of Europe.

The following list of words derived from the Latin *mittere,* to send or throw, will serve as an indication of what the English language owes the Latin:

admit	dismiss
admission	emissary
commissary	emit
commission	intermission
commit	intermit
committal	mass
committee	message
demit	messenger

missile	promisor
mission	promissory
missionary	remission
missive	remit
omission	submission
omit	submissive
permission	submit
permit	transmission
promiser	transmit

The word mass in this list denotes the celebration of the eucharist. The word mass meaning a lump of matter is from a different root.

It must be borne in mind that many of these words are not, in their present form, direct derivatives of the Latin word. The root is found in the Latin form, but the word may have passed through the French, or through various changes in English before it appears as used today.

Latin America, that part of the New World in which Spanish, French, or Portuguese is spoken. It includes Cuba and the other West Indian islands, Mexico, the states of Central America, and all South America, save British and Dutch Guiana. Latin America is a convenient collective term for the countries in which English is not the official language. See LATIN.

Latitude, angular distance north or south of the earth's equator. The angular distance between the equator and either pole is divided into ninety degrees. The northern boundary of a large part of the United States is the forty-ninth degree of north latitude; that is to say, it is a line on the earth's surface parallel to the equator, 49-90 of the total angular distance from the equator to the pole. St. Paul's, London, is situated in latitude 51.3048° north. Cape Horn is in latitude 55° 59′ south. If the sailor at sea is able to get the altitude of the sun above the earth's horizon, or of a star, he is able, with the aid of his almanac and watch, to determine the latitude in which his ship is sailing. Latitude is an important factor in climate. Unless other factors intervene, the higher the latitude, that is to say, the nearer the pole, the cooler the climate. See LONGITUDE.

Latona. See LETO.

La Tour, lä-toor′, **D'Auvergne Théophile Malo** (1743-1800), a French soldier of the Revolution and leader of a company of grenadiers, He declined higher appointments. Napoleon dubbed him "The First Grenadier of France," a title of which he was exceedingly proud. His company was known as "The Infernal Column." It always sought the point of greatest danger and claimed the honor of leading the charge. While attached to the army of the Rhine, Latour fell at Oberhausen, Bavaria, June 27, 1800. His heart was embalmed and placed in a silver box. It was carried by one of his comrades. Whenever the roll of his company was called his name was called with the rest, the oldest sergeant answering, "Died on the field of honor."

Latter-Day Saints. See MORMONS.

Latvia, Republic of, was a former province of Russia. It is bounded on the north by Esthonia, on the east by Russia, on the south by Lithuania and Poland and on the west by the Baltic Sea. The area is about 25,000 square miles. The population in 1922 was 1,835,870, eighty per cent of which are Letts. Agriculture is the chief industry and flax is the chief crop. Dairying, live stock raising and growing food crops are also important. The manufactures include paper, match wood, metals, wood work, chemicals and textiles.

The chief cities are Riga, the capital, Windau and Lebau all of which have good harbors. The country has more than 1,800 miles of railways and a prosperous merchant marine. A large percentage of Russian imports and exports pass through the country. The money unit is the lat, the par value of which in United States money is 19.3 cents. Latvia is a member of the League of Nations.

Laud, William (1573-1645), an archbishop of Canterbury. He was a native of Reading, the son of a clothier. He was educated at Oxford. He took priest's orders in the Episcopal church. In 1617, as royal chaplain, he accompanied King James in a trip to Scotland. He foreshadowed his future course by advising the king to insist on "papistical reforms" in the Scottish church. He rose from one position to another rapidly. Charles I was pleased with Laud's zeal for episcopacy and made him bishop of Bath and Wells, and later Bishop of London. In 1630 Laud was made Chancellor of Oxford. He gave

the University a rich collection of manuscripts and founded a chair of Arabic. In 1633, Laud became Archbishop of Canterbury, primate of all England. At this point his real career began. "Since I came to this place," he said of himself, "I labored nothing more than that the external public worship of God—too much slighted in most parts of this kingdom—might be preserved, and that with as much decency and uniformity as might be, being still of opinion that unity cannot long continue in the church when uniformity is shut out at the church doors. And I evidently saw that the public neglect of God's service in the outward face of it, and the nasty lying of many places dedicated to that service, had almost cast a damp upon the true and inward worship of God,—which, while we live in the body, needs external helps, and all little enough to keep it in any vigor."

Laud ordered the communion table to be removed to the east end of the English churches, where it had stood prior to the Reformation, and ordered the communicants to receive the sacrament of the Lord's Supper on their knees. The Puritans regarded this change as a return dangerously near to the Catholic mass, and feeling ran high for and against.

In political matters Laud was for the prerogative of the king against the commons. He stood with Strafford for arbitrary royal authority. He so far led the English church toward Catholicism that the pope offered him a cardinal's hat. When the storm broke and the Long Parliament took up the reins of authority, Stafford and Laud were accused of treason. Failing to find statutory grounds for conviction both were condemned by bills of attainder which the Lords durst not refuse to pass. The Scotch in particular insisted on Laud's execution. He was beheaded on Tower Hill, January 10, 1645, in the seventy-second year of his age. His death was the occasion of rejoicing in the New England colonies.

Laudanum. See OPIUM.

Laughing Gas. See NITROGEN.

Laughlin, James Laurence (1850-), an eminent American political economist, emeritus professor of political economy of the University of Chicago after 1916. Born at Deerfield, Ohio, he was educated at Harvard University and at the University of Geissen, Germany. From 1878 to 1887 Mr. Laughlin was instructor and assistant professor of political economy at Harvard University, and from the latter year until 1890 was president of the Manufacturers' Mutual Fire Insurance Company of Philadelphia. For two years Mr. Laughlin was professor of political economy at Cornell University, and in 1892 was placed at the head of the department of political economy at the University of Chicago, continuing in active service until 1916. Mr. Laughlin was always an able and accurate investigator of economic phenomena, and did very valuable work in applying the principles of his subject to current economic problems. He prepared the plan for the present financial system of San Domingo, and served as a member of the Indianapolis Monetary Commission in 1897. Mr. Laughlin was also a member of the Pan-American Scientific Congress in 1909. In 1913 his advice was frequently sought by the framers of the Federal Reserve Bank Act. Mr. Laughlin wrote several notable books on his subject, the most important being *The Study of Political Economy, History of Bimetallism in the United States, Elements of Political Economy, Credit of the Nations, Facts About Money* and *Money and Prices*.

Laundry, an establishment where clothes are washed and ironed. The Monday washboiler, tub, furrowed wash-board, rubber wringer, clothesline, clothespins, ironing tables, and flatirons are time-honored institutions. The operations of boiling, rubbing, rinsing, wringing, drying, and ironing are familiar to the housewife. Washing machines of various types have lessened somewhat the labor of rubbing, but fine goods must yet be washed by hand.

Many European cities, especially French cities, provide public laundries. In Paris there are large establishments to which laundrymaids in white caps and trim aprons bring their baskets of clothes, and from which they return with a pile of neatly folded clothing or laundered linen. The women furnish their own soap. For a few

sous they are provided with water and utensils, and are given a place at the long heater, tub room, drying facilities, and tables at which to iron. Even laundry-maids who take in washing at so much per dozen do their work at the public laundry. At Geneva, public washrooms, long, low, shed-like buildings, line the Rhone just below the bridges for some distance. Instead of Caesar's legions barring the passage of the Gauls, an array of bare armed, short skirted women may be seen dipping their buckets in the swift waters or doing their washing under cover of a friendly shed roof. They carry their wash home to dry and iron.

So far as this country is concerned, the large laundry with steam appliances originated at Troy, New York, the home likewise of the collar and cuff industry. Nearly every considerable town in the Union now has its "Troy Laundry." In these large establishments three distinct steps may be recognized—washing, drying, and ironing. The first operation is performed usually in a machine known as a reverse washer. The clothes are placed in an inside cylinder of wood or brass, perforated to admit the free passage of steam and soapsuds. This cylinder is run on an axis inside of a larger watertight casing of galvanized iron or wood. Hot water and steam are admitted by means of pipes. The cylinder containing the clothes is revolved several times in one direction, then in the other, thus loosening up the clothes and enabling the current of suds to cleanse them thoroughly.

Instead of passing the wet clothes through wringers to break buttons, they are placed inside of a second perforated copper cylinder, called an extractor, and subjected for ten or twenty minutes to a rotary motion of a thousand revolutions a minute. Nearly all the moisture is thrown out by centrifugal force. The pieces are then hung on racks and sent through a steam-heated drying room. A current of air drawn by a fan carries away the moisture.

In the ironing department hand work has been superseded largely by machines. Collars and cuffs are starched and are passed between a series of drums and rollers. The drums are covered with felt and padding, like an old-fashioned ironing-board. The rollers, relied upon to put on a polish, have themselves bright, polished, steam-heated surfaces of metal. An ironing machine of this sort may have rollers of sufficient length, from one to four feet, to busy several operators in feeding and in carrying away the finished work. One large machine is capable of polishing as high as 3,000 dozens of collars or cuffs in a working day of ten hours. Shirts require the use of several machines—one for the neck-band, one for the bosom, another for the cuffs, etc. Towels, sheets, table linen, and other flat pieces are smoothed by stretching them on a swiftly revolving, steam-heated drum. In the laundry such a machine is known as a mangle.

See SOAP; COLLAR.

Launfal. See VISION OF SIR LAUNFAL, THE.

Laureate. See POET LAUREATE.

Laurel, a bush or tree of the Levant, fifteen to sixty feet, with large, lanceolate, shining leaves, cream-colored flowers, and black, oval, half-inch berries. In ancient Greece the laurel was sacred to Apollo. "Apollo's laurel bough," says Marlowe. A laurel wreath of berry-bearing twigs was the victor's crown in the national games and in oratorical or poetical contests. "To bind the laurel on his brow," is to ascribe high honor. "To win laurels," is to excel, to gain praise and fame. There is a tendency to attach the name to diverse plants having shining leaves. The laurel of the ancients and of the poets is known also as the bay laurel. Botanists call it *Laurus nobilis*. The American laurel or calico bush is a handsome shrub, but it is related to the heath family. Ground laurel is the trailing arbutus.

Laurel, Miss., an industrial city and the county seat of Jones County, is 110 miles southwest of Mobile, Ala., on three railroads. This city is in the heart of the yellow pine district of Mississippi, as well as in a fertile cotton-growing district. The cotton mills and saw mills are the chief industrial establishments of the city, but there are also fertilizer plants, a foundry, a cotton compress, brick and tile works and railroad repair shops. It has a fine

city hall, a Y. W. C. A., a Y. M. C. A., a state agricultural farm, a $200,000 public library and art gallery and good schools. Laurel is a typical example of the growth of American cities; in 1890, it was a village with a population of 100; in 1910, the population was 8,465; 1920 it was 13,037.

Laurier, lo′ri-ā, **Sir Wilfred** (1841-1919), former premier of Canada. This great and good Canadian was born at St. Lin in the province of Quebec, of French-Canadian parents. From his mother he inherited not only his personal beauty but his intellectual ability and charm of manner that have combined to make him the leading colonial statesman of his age. His early college training was acquired at L'Assumption College but his legal study was at McGill University at Montreal. He was admitted to the bar in 1864, and rose rapidly in his profession. In 1871, he first entered public life, being elected as the Liberal representative from his district to the assembly at Quebec. This had always been a conservative body, and the entrance to it of his liberal ideas was a shock to many of the members. Nothing but his personal magnetism could have carried him further in his political career, for it was impossible for conservative statesmen to believe that he could combine stanch allegiance to Britain with loyalty to the French Canadians. His boundless tact, keen sense of humor, and Gallic gift of oratory enabled him to gain the confidence and good-will, if not the support, of his opponents, and in 1896 he became premier of the Dominion.

As prime minister Sir Wilfred stood for many important measures. His aim has been to unify Canada by bringing together the French-Canadian and the Anglo-Saxon elements; to make Canada politically independent of British control while still remaining within the British empire; to establish Canada's economic independence; to adopt a high tariff policy for Canada as a means of securing reciprocity agreements; to develop the transcontinental railroads in the Dominion; and, most important of all, to effect reciprocity with the United States.

He has been a most ardent supporter of reciprocity across the border, and has turned a deaf ear to all British protests against closer relations with the United States. Neither has he listened to those who would raise the bogey of annexation of Canada to the United States. In his own words is summed up the situation as he sees it: "It is that we, the two nations which now share the continent, shall give to the world the spectacle of brethren living in peace. We have the longest frontier dividing any two nations. On that frontier there is not a fortress, not a gun, not a soldier."

The Joshua who is leading Canadians along the new path that is opening before them; a man who has won for himself in Britain and in France, high distinction and deep respect; a man who by virtue of his work in the old countries, has visibly helped the cause of Canadian nationality.—*Herald.*

Lausanne, Switzerland, the capital of of the Canton of Vaud, is situated on the lower slopes of Mont Jorat, about a mile and a quarter north of Lake Geneva, a splendid view of which may be had from the town. The valley of the Flon once separated the old and new portions of Lausanne, but the depression has been almost completely filled in, and is crossed by a two-story viaduct called the Grand Pont.

One of the most impressive buildings is the Gothic Cathedral of Notre Dame, built in 1235-75 and restored in 1906. The Palais de Rumine, constructed in 1904, contains a splendid museum of natural history, fine arts and industrial arts. The National Supreme Court of Appeals, the prison, the theater, the cantonal bank and the new post office are also noteworthy. The city contains insane asylums and a home for the blind.

The industrial plants of the city are not numerous. They produce sugar, tobacco products, chocolate, printed matter, especially books, and machinery, The chief articles of commerce are grain, lumber and wine.

Lausanne is a notable educational center. At the head is the University of Lausanne, founded in 1537 as an academy for Protestant ministers and made a university in 1891. It had an enrollment of

1,254 in 1922. There are schools of agriculture and viticulture, numerous boarding schools for girls, and a Protestant theological school.

Lausanne is much favored by tourists, for whose accommodation there are many splendid hotels. The city was the scene of the Lausanne Conference held in 1922 to effect an agreement between Turkey and the allied powers and to establish peace in the Near East. Pop., 1920, 68,533.

Laut, Agnes Christina (1871-), a Canadian author whose historical and biographic sketches are well known, was born at Stanley, Ontario, but removed to Winnipeg while very young. She studied at the University of Manitoba until compelled by failing health to leave. In 1895 Miss Laut secured a position as editorial writer for the Manitoba *Free Press,* and became special correspondent for several Canadian and American journals. After removing to New York she joined the staff of *Outing.* In this magazine appeared the stories of life in the Northwest that won Miss Laut a large public. Her works include *Lords of the North, Canada, Empire of the North, Heralds of Empire, Freebooters of the Wilderness, The New Dawn, Vikings of the Pacific* and *Through Our Unknown Southwest, the Wonderland of the United States.*

Lauterbrunnen, the name of an Alpine valley in the Swiss canton of Bern, through which flows the river Weisse Lütchine, one of the chief tributaries of the Aar. The valley is surrounded by perpendicular walls of sandstone from 1,000 to 1,600 feet in height, from which pour innumerable waterfalls. The finest of these is the Staubbach.

Lauzon, Quebec, a manufacturing town, is situated on the south bank of the St. Lawrence River, two miles northeast of Levis. It is served by the Quebec Central and the Intercolonial railroads. The principal industry of Lauzon is ship building and repairing. There is a large dry dock and a recently constructed patent slip. Trunks, hand bags and boxes are also made here. Lauzon is electrically lighted, and has good public schools and a special girls' school. In 1921 the population was 4,966.

Lava, lä'va, the molten material poured out of volcanoes. As volcanoes are widely distributed, the lava poured out by them represents different parts of the interior of the earth and varies accordingly. When lava cools slowly it forms crystalline rocks; when it cools quickly it forms a glassy rock, of which obsidium is the best type. Characteristic rocks are basalt and porphyry, tufa and pumice. Disintegrating volcanic rock forms a fertile soil. The fertility of the slopes of the European volcanoes, as Vesuvius and Etna, tempts villagers within the zone of danger. In 1812 a volcanic eruption of St. Vincent covered the Barbadoes Islands with several inches, not of snow, but of fertile, fluffy black dust. The rich sugar-cane fields of Hawaii are of volcanic formation. During what is known as the tertiary geologic age a vast outflow of lava flooded the Pacific coast from Idaho to the ocean. It covered southern Idaho, the greater portion of Washington, eastern Oregon, and northeastern California. In cooling, it formed basaltic rock. The plains of the Snake and the Columbia are volcanic. Extensive areas near Flagstaff, Arizona, are covered with coarse black soil resembling crushed coke. Lava soil of high fertility covers large areas in Java, Japan, Italy, Sicily, and Hungary. Wherever rainfall is sufficient or water can be had, the valleys are exceedingly fertile. Some say that basaltic soil forms the best wheat land known. See VOLCANOES; SOIL; BASALT; FINGAL'S CAVE.

Laval University, a French institution established in Quebec, Canada. It was founded in 1852 and is controlled by the Roman Catholic church. The faculties are four: Theology, law, medicine, and arts. A bacteriological laboratory and a chemical laboratory were erected in 1897-8 and 1899. The museums are valuable, containing some of the finest Indian collections in America. The library has 140,000 volumes. The faculty numbers over fifty, and there are 400 students. The rector is the highest officer and together with the council administers all affairs pertaining to the university.

Lavender, an aromatic shrub of the mint family. Lavender grows from one to three feet tall. The name is related to

lave or wash, having reference to the use of lavender in the bath. The flowers have a blue tint and appear in cylindrical terminal spikes. A pale lilac color, known as lavender, takes its name from them. Lavender is an old garden favorite. The English housewife lays away clothing with sprigs of lavender between its folds to give an agreeable odor which repels moths. Lavender is a native of Persia, the Canaries, and the Mediterranean region. It covers vast tracts of land in Spain, Italy, and southern France. It is cultivated for commercial purposes chiefly in France and in the counties of Surrey and Hertford, England. California and the black belt of Alabama are said to be well adapted to the needs of the plant. Oil of lavender is a lemon-yellow, bitter, aromatic fluid with a burning taste. It is used in the manufacture of perfumery and lavender water. The best oil is distilled from the flowers, though leaves and stems are used for the same purpose. An acre of lavender yields from ten to twenty-five pounds of oil. The stills of Grasse, France, the great center of lavender oil production, yield as high as 200,000 pounds a year. In planting, stems are cut into short sections and dropped in a furrow. The seed is not trustworthy. The plants are cut in early blossom to get full strength. They are taken to the still at once lest they wilt and turn black. See PERFUMERY.

Lavoisier, lä-vwä-ze-ā′, **Antoine** (1743-1794), a celebrated French philosopher. He was the son of a wealthy merchant. He became a member of the French Academy of Science. Lavoisier gave the phlogistic or fire material theory its last blow. Among other experiments he roasted tin in a glass retort with a long beak which was closed when the air had expanded. At the end of the roasting the retort and contents showed no change in weight. On breaking the point of the retort beak air rushed in with a hissing sound; the retort and contents showed an increase in weight. On collecting the roasted tin and weighing it he found that the tin had increased in weight during the roasting and that this increase was equal to the increase in weight of retort and contents. He concluded that part of the air in the retort combined with the tin during the roasting process. This and similar experiments overthrew the theory of phlogiston. See article on CHEMISTRY.

Lavoisier took an interest in municipal affairs, gaining a prize while yet a young man for an essay on the best means of street lighting. To prepare this paper he shut himself up in a darkened room for six weeks and experimented with artificial lights. He had an enthusiastic following among the young men of family and scientific tastes, but he does not appear to have been appreciated by the masses. When the French revolution broke out Lavoisier was one of the officials engaged in managing the government tobacco monopoly. He and his colleagues were accused,—it matters little of what,—but in this case, of mixing with the tobacco "water and other ingredients hurtful to the health of the citizens." He asked time to complete some researches, but "The Republic has no need of chemists. The course of justice cannot be suspended," was the reply. May 8, 1794, he was guillotined. Despite the threat of Robespierre, Lavoisier's comrades dared to place a wreath on his grave.

Lavoisier is regarded as the founder of modern chemistry. Besides proving that water can be decomposed into its elements; that oxides are formed by the union of an element with oxygen; and making other important discoveries, he wrote a book on chemistry and was chiefly instrumental in founding a modern system of naming elements and compounds.

See FRENCH REVOLUTION.

Law, in the sense treated here, is the body of rules and principles laid down for the organization and government of a country. The law of England and of the United States has developed along three main lines, constitutional law, common law and equity, and statute law. Constitutional law includes primarily the broad general principles of government embodied in the constitution. In England, where the constitution is the result of many centuries' growth, the laws are not collected in a written document as in the Constitution of the United States, but they are none the less fundamental and binding. By far the greater part of the constitu-

tional law of the United States is found in the statutes enacted by Congress under the powers given it by the Constitution. Treaties also form part of our constitutional law. Common law had its origin in England, where it was developed by the king's justices. They had no idea of making law, but tried to decide cases according to the customs of the community. Their decisions served as precedents for succeeding judges, though they added to or overruled them as they thought right, until today the common law is a huge and still growing body of precedents and legal principles deduced from them. Sometimes a person felt that he had not got justice at law, and so appealed to the king. As such cases became numerous, a king's court was built up, and there was evolved the system known as equity. It gave relief in cases where there was none to be had at law, and so supplemented the inflexible rules of the common law with the principles of simple justice. The granting of an injunction today is a survival of the principles of equity. The American colonists brought the principles of common law and equity with them. Today in the United States, cases at law and at equity are usually heard in the same court, though at different sittings. The term "common law" has come to cover both meanings.

Statute law in the United States includes the statutes enacted by the state legislatures. They generally concern only the working affairs of the government, prescribing, for example, the manner in which elections are to be held, though a few matters of private law, such as wills, marriages, divorces, and the like are controlled by statutes. Considered as a whole law falls into two divisions, civil and criminal. The former aims to protect the rights and redress the wrongs of individuals. Hence it deals with all cases concerning real estate, personal property, and personal liberty. The latter has for its purpose the prevention and punishment of public wrongs, or wrongs against the community or state. Such deeds are known as "crimes," and are of two kinds, felonies and misdemeanors. The first class includes very grave offences such as murder and arson; the second class includes minor offences like the use of false weights and measures and disturbance of the peace.

Law, Andrew Bonar (1858-1923), a noted British statesman, delegate for Great Britain to the Paris Peace Conference, and Prime Minister in 1922. He was born in New Brunswick, Canada, and educated there and in Glasgow, Scotland. In Scotland Mr. Law engaged in the iron business, and was chairman of the Scottish Iron Trade Association for some years. Entering Parliament as a Unionist in 1900, he served almost continuously until 1921. From 1902 to 1905 Mr. Law was Parliamentary Secretary of the Board of Trade, was leader of the Opposition in the House of Commons from 1911-15, and Secretary of State for the Colonies in 1915-16. From 1916 to 1921 he was leader of the House of Commons, and from 1916-19 was member of the War Cabinet. From the time of his entrance into Parliament, Mr. Law has taken an active interest in Tariff Reform. He is an execllent debater, and during the war he secured the passage of the two largest budgets in England's history.

Law, John (1671-1729), a celebrated Scottish financier and promoter of commercial schemes. He was born at Edinburgh and died at Venice. His father was a goldsmith. While Law cannot be termed a penniless adventurer he went to London when a young man to seek his fortune. He appears to have led a gambling, dissolute life, becoming involved in a social intrigue. In 1694 he killed Beau Wilson in a duel and was condemned to death. He made his escape to Holland, then the commercial center of Europe. A few years later he returned to Scotland. He proposed that the Scottish Parliament tide over a period of commercial depression by the issuance of paper money. His plan not meeting with approval he betook himself again to a roving, gambling life. He visited Rome, Genoa, Vienna, Brussels, and Paris. He won large sums of money by gambling and spent his winnings recklessly.

In Paris Law made the acquaintance of the Duke of Orleans. When in 1715 the king died and the duke became regent, Law was in high favor. Although he had

previously been expelled from Paris as a suspicious character he was now permitted to put his schemes into operation to his heart's content. He organized trading companies, founded a royal bank, took over the debts of France, was intrusted with the collection of taxes, and carried matters with a high hand. He had a practical monopoly of exchange. Business men in outlying towns were obliged to make and receive remittances through his bank. Among measures tending to make him popular was a reduction of the interest on the national debt. His company was authorized to issue shares of stock. They rose rapidly in value. Semi-annual dividends of six per cent were promised. The carriages of the great filled the street in front of Law's banking house, and the nobility elbowed each other in their haste to get a word in private with John Law and to invest their fortunes in the shares of his bank. He created the greatest financial bubble known.

Law kept up his dividends for a time by the sale of stock. When the total issue of stock reached a point where an annual dividend of less than one per cent could be paid, people lost confidence and the bubble burst. Thousands who had borrowed money to buy shares or who had invested their all under his advice, were ruined. Distress and financial bankruptcy resulted throughout France. Law fled the country and resumed a wandering life. He settled down finally at Venice in poverty and was forgotten. Those who visited him in his later days stated that he never lost confidence, however, in his financial schemes. A vivid picture is drawn in Emerson Hough's recent novel, *John Law and the Mississippi Bubble.*

Lawn Tennis, a game of ball played on a grassy plot by two or four persons. It is derived from the old game of tennis, known by way of distinction as court tennis. A space or court 78 feet long and 27 or 36 feet wide is first laid off. It is then divided by a line running lengthwise. A net three feet high is suspended across the middle. Service lines are drawn on each side twenty-one feet from the net, thus dividing the court into eight oblongs. Each player carries a bat, known as a racket. In playing, the ball is caught in the racket and tossed to and fro over the net. Eeach side aims to cause the ball to light in one of the oblong spaces defended by the opposite party. Questions of rebound, limits, and striking the net are settled by tennis rules. The game requires a quick eye, a light foot, and a stroke well under control. See GAMES.

Lawrence, James (1781 - 1813), an American naval officer, one of the greatest heroes of the service and the originator of the navy's watchword—"Don't give up the ship." Born at Burlington, N. J., he entered the navy as a midshipman in 1793, was promoted lieutenant in 1802, and in 1804-05 served with honor in the war against Tripoli. He was second in command in Decatur's expedition to burn the captured *Philadelphia* under the guns of the shore batteries. In 1808 he served as lieutenant on the *Constitution,* and before 1811 had served on such famous ships as the *Argus,* the *Wasp* and the *Vixen.* In 1811 he was promoted captain and given command of the *Hornet.* Cruising the South American coast with Bainbridge's squadron in 1812, Captain Lawrence captured the English ship *Resolution,* and later captured the English brig, *Peacock,* the Americans losing only one man killed and two wounded. For this success Captain Lawrence was given a gold medal by Congress, and was placed in command of the *Chesepeake,* a ship manned by a poorly trained crew and bearing a reputation for ill luck. On June 1, 1813, the *Chesepeake* engaged with the English ship *Shannon.* Captain Lawrence, fighting a losing fight, was severely wounded, but refused to leave the deck or to surrender. The *Chesepeake* was captured, however, and was taken to Halifax, where Captain Lawrence died on June 5. It was in this engagement that he gave his spirited command.

Lawrence, Kans., the county seat of Douglas County, is situated on both banks of the Kansas River and on two railroads, 41 miles west by south of Kansas City. Lawrence was the first of the "free-state" towns founded by the Emigrant Aid Society in 1854, immediately following the

passage of the Kansas-Nebraska Bill. In 1855, the town was besieged for a time by a pro-slavery force; and on May 21, 1856, it was taken and partially destroyed by another pro-slavery force. In 1863, a band of raiders under Quantrell almost completely destroyed the city and killed more than a hundred of its citizens. Lawrence is a trading center of importance, and in its factories are produced flour, paper, shorts, sashes, doors, bricks and tiles, and barbed wire. It contains the University of Kansas, the Haskell Industrial School for Indians, a Carnegie library and splendid public schools. It has also a Federal building, a Y. M. C. A., and several parks. The population in 1920 was 12,456.

Lawrence, a manufacturing city of Massachusetts, on the Merrimac River, near Boston. A large dam and two distributing canals make the power furnished by the river available for manufacturing. Since the completion of the dam, in 1848, the city has been one of the foremost manufacturing centers in the United States. Woolen goods are the leading product, the value of which in one year is over $26,000,000. Other commodities produced in large amounts are paper of various kinds, cotton goods, machinery, and shoes. A courthouse costing $280,000, a large post-office building, the public library and the Masonic Temple are noteworthy buildings. The city has a good public park system. In 1920 the population was 94,270.

Laws of Vibrating Strings. See SONOMETER.

Lawton, Henry Ware (1843 - 1899), an American military officer, was born at Manhattan, Ohio. Entering the army at the opening of the Civil War, he served distinctively throughout the campaign, rising from the rank of sergeant to that of brevet colonel of volunteers. Commissioned second lieutenant in 1866, he saw much active service against the Sioux and the Ute Indians, capturing the famous Indian chief Geronimo. He accompanied the American army to Cuba in 1898, and after the fall of Santiago was made major general. Ordered to the Philippines as second in command to General Otis, General Lawton was in constant active service until his death in an attack upon the Filipinos at San Mateo, Luzon, Philippine Islands.

Layamon, lä′ya-mŏn, a British chronicler of the thirteenth century. Layamon was a priest at Ernleye, on the banks of the Severn. The work for which his name is remembered is *Brut.* It is an amplified translation of the French *Brut d'Angleterre* of Wace. Layamon's *Brut* is of linguistic, rather than literary interest. It is a specimen of early English before it had become gallicised, that is, before the influence of the Norman-French invasion had affected the language to any marked degree. Only about ninety words derived from the French appear in the entire poem of 56,000 lines. Nothing of Layamon's life is known, and the exact date of the *Brut* is a question. The date given usually is 1205.

Lay of the Last Minstrel, The, a narrative poem by Sir Walter Scott published in 1805. It is a sixteenth century tale, and the scene is laid on the Scottish border. This poem was Scott's first great literary success and made him immediately famous. In *Abbotsford* Irving tells how Johnny Bower, sexton of the parish and custodian of the ruin at Melrose, appreciated this poem. The old man hated desperately to hear any other of Scott's writings ranked above it. He said, "Faith, it's just e'en as gude a thing as Mr. Scott has written—an' if he were stannin' here I'd tell him so—an' then he'd lauff." See SCOTT, WALTER.

Leacock, Stephen Butler (1869-), a Canadian educator and author was born at Swanmoor, Hants, England, but went to Canada as a boy and received his education at Upper Canada College, University of Toronto and University of Chicago. From 1891 to 1899 Mr. Leacock was an instructor at Upper Canada College, and at the Graduate School of the University of Chicago from 1899 to 1903. Since then he has been identified with the department of political economy at McGill University. He is now head of the department. As lecturer and writer, Mr. Leacock is at once an authoritative political economist and a delightful humorist. He is the author of *Elements of Political Science, Baldwin and La Fontaine—Makers of Canada,*

Literary Lapses, Nonsense Novels, Frenzied Fiction, Moonbeams from the Larger Lunacy, Behind the Beyond, Essays and Literary Studies, The Unsolved Riddle of Social Justice, The Hohenzollerns in America, My Discovery of England and *Winsome Winnie.*

Lead, a soft, bluish gray metal with high lustre. Lead is 11.37 times as heavy as water. It melts at 619° F. If melted in the air, the surface becomes coated with dross, giving an impression of impurity, but it is simply a combination of lead and oxygen. By removing the crust and allowing air access to the pure molten lead a new coating will form and so on until the lead is used up. Lead, in quantity, is almost as poisonous as mercury. Absolutely pure water, which, by the way, is tasteless and without sparkle, dissolves a small amount of lead in open air, but ordinary water does not. The Latin name of lead is *plumbum;* whence the terms plumbing, plumber, and plumb-line.

Lead occurs in nature in several minerals, the most important of which is a compound of lead and sulphur, known as galena. Galena, Illinois, takes its name from this ore. In the United States, lead ore has been found in the mountains from Maine to Georgia, but not in very profitable quantities. The Missouri lead district includes the lead ores of Kansas, Wisconsin, Illinois, and adjacent states. It centers commercially in St. Louis and has given that city an importance of long standing as a producer of ammunition. The first mining of Colorado was that of lead at Leadville on the head waters of the Arkansas River where a most remarkable silver-lead lode was discovered. Utah has important lead-silver mines. The famous Coeur d'Alene mine of Idaho yields as high as 60,000,000 pounds of lead a year. Montana and Arizona, in short all the mountainous states of the West, produce lead. Missouri, however, is far ahead of any other state in the United States as a producer of lead. The total amount of her lead production in 1920 was 163,290 tons. Until comparatively recently, Spain led the world in the production of this metal, but is now outranked by the United States. The following table gives the production figures for twelve countries:

Country.	Tons
United States	398,221
Germany	285,596
Spain	211,171
Mexico	121,434
Italy	44,600
Canada	33,573
Peru	32,500
Greece	28,294
Jugoslavia	17,000
China	13,527
Japan	4,809
Guatemala	139
Total tons	1,190,865

Lead in the form of the carbonate makes the white lead used in paints. This is its most extensive use. Next in importance is the use in lead pipe and sheet lead employed by plumbers. There is just a chance of water, tinged with certain acids dissolving enough lead to be poisonous; but the danger is so slight, and lead is so free from rust and bends into crannies so easily, that it is a favorite metal. Large quantities of lead are used in making shot. The lead is mixed with a little arsenic, three parts out of 700, to make it harder and to cause it to assume a more perfectly spherical form when dropped through the air. Manufacturers erect tall shot towers, as at St. Louis. The molten lead is poured through a sieve at the top of the tower and has time in falling not only to gather in globules, but to harden ere it falls into a tank of water at the foot. The shot is then run over sieves to assort it into sizes.

Type is made from lead and antimony combined in the ratio of seventy-six parts of lead to twenty-four of antimony. The antimony is added to give hardness and also because it expands slightly in cooling and gives a clear-cut, sharp face to the type. The pigment known as *chrome yellow* is chromate of lead. Lead was one of the metals known to the ancients, who called it saturn. Lead poisoning was known as saturnine poisoning.

See PAINT; TYPE.

Lead Pencil, an instrument for marking, drawing, or writing, formed of strips of graphite, colored chalk, etc., inclosed in a handy case of wood or metal. The so-called black lead of a pencil makes

a mark like that of a slug of lead. It is not lead at all, but graphite, a form of carbon akin to coal and the diamond. The graphite of American lead-pencils comes chiefly from Ticonderoga, New York. It is pulverized thoroughly and sifted to remove course particles. It is then ground in water with a fine, gritless clay from Austria and Bohemia. The grinding continues for a week or two. The paste thus formed is forced through small holes or dies, coming out in soft, wire-shaped threads. These are cut into pieces the length of a lead pencil, and are heated for several hours in an oven at 2000° F. to make dry, tough, and durable leads.

The wood in use is cedar from the swamps of Florida; 730,000 cubic feet are required annually. This cedar is cut into thin slats half the thickness of a pencil. They look much like shingles, only they are of uniform thickness. The slats are received in bales at the pencil factory where they are planed and grooved. The leads are laid in the grooves by hand. Two slats are then glued together and sawed into strips, each strip containing a lead. These strips are turned in a lathe, polished, varnished, stamped, cut smooth at the ends, and put up in proper bands and boxes for the trade. The rubber used for erasers comes chiefly from the forests of the Amazon, and is obtained by coagulating the sap of the rubber tree. Millions and millions of dollars are invested in mining and in shipping graphite and clay; in buying and refining rubber; in logging, sawing and carrying cedar; and in providing expensive mills, furnaces, and machinery for making pencils; and yet a complete pencil is sold not infrequently for a penny.

One large pencil company advertises 700 different kinds, shapes, and qualities, and spends $20,000 a year merely for gold used in stamping. All this is possible and reasonably profitable to the maker by reason of the enormous number of pencils made. The output of the one company mentioned is 50,000,000 pencils a year, enough, placed end to end, to reach 5,100 miles, or from Boston to San Francisco and back to Chicago again. This is only about one-fifth of the total output from American factories. The people of the United States use, whittle away and lose 315,000,000 pencils a year. The lead-pencil industry originated in Germany. Nuremberg is still a center of manufacture.

The manufacture and use of lead pencils in metal cases, of gold, silver, and various alloys, has been greatly extended in recent years. Pencils of this kind have long been manufactured for sale by gold and silversmiths, but mass production and mechanical improvements have now made them both cheap and popular. In these metal-cased pencils there is usually a reservoir of thin leads, and the one in use is gradually screwed down to renew the writing point as it wears away. The mechanism of such pencils is ingenious, and the pencils are ornamental as well as useful. Many are furnished with a rubber eraser which is concealed and protected by a metal cap, forming an ornamental finial for the case.

Lead pencils to the value of about $25,000,000 were manufactured in the United States in 1920, the product of twelve factories, employing 6,000 wage-earners.

Colored pencils are made from special clay finely ground with color, such as Prussian blue or vermilion, and mixed with a binding material; then pressed into sticks which are toughened by boiling in a mixture of special fats and waxes before they are placed in the wooden slats prepared to receive them. For copying-ink and indelible pencils, an aniline dye is used, the color being soluble in water in order that impressions may be taken on tissue paper.

Both black and colored pencils are now frequently incased in paper instead of wood, by a process invented toward the end of the nineteenth century. In making such pencils a sheet of paper cut for part of its width into strips about ¼ inch wide is wound spirally around the lead to form a case of the usual thickness, and the surface is painted. As the pencil point wears down, more lead may be exposed for use by cutting and unwinding one of the narrow strips of paper.

Lead pencil manufacture in the United States began in 1812, when William Monroe, of Concord, Mass., introduced a proc-

ess of pulverizing and mixing graphite and other necessary materials and incasing the mixture in cedar holders. Joseph Dixon subsequently became the leading American manufacturer, while in 1860 the Fabers of Germany established a branch factory in the United States.

Lead Poisoning, a serious disorder caused by the system being poisoned by lead. Painters and those working in white lead factories are the greatest sufferers. The most common result is lead colic, or painters' colic. Poisoning by lead may also result from drinking water which has passed through new lead pipes, from living in rooms freshly painted with lead colors, or from eating candy colored with lead products. Kidney disease, epilepsy and sometimes serious brain trouble may ensue, sometimes terminating fatally. The first sign of lead poisoning may be detected in the face of the sufferer, which turns to a livid, brownish hue. The skin is dry, and there is a metallic taste in the mouth, accompanied by much thirst. Prompt action by a reputable physician may avert death.

Lead, South Dakota, a city known for its gold mines, which are rated as among the largest in the world. It is situated 250 miles west of Pierre, the capital. The Chicago, Burlingtoin & Quincy and the Chicago & Northwestern railroads serve the city.

From the ordinary mining camp, Lead has developed into a modern city, with all up-to-date facilities. Modern, handsome buildings on well paved streets are found here, and the city presents an attractive appearance. Business and technical schools are provided by the city, and through the benefactions of Mrs. Phoebe Hearst there are several institutions looking towards the welfare and happiness of the miners employed in the mines. While the United States census only gives Lead a population of a little over 5,000, the floating population of miners brings it very near to 10,000. The mining companies have provided a so-called Recreation building, which contains an auditorium, swimming pools, libraries, bowling alleys and a great many other pleasant features to lighten the burden of the toilers. One of the largest cyanide plants in the world is located here.

About thirty-five per cent of the population consists of English, Austrians, Italians and Finns. From a mining camp, Lead has developed into a city. It is picturesquely situated in the Black Hills, in the midst of wild scenery. Lead was settled in 1877, was incorporated as a city in 1890, and adopted the commission government in 1912. *Lead* is a miner's term, meaning the direction of an ore vein.

League of Nations, a covenant of states designed to prevent war and to promote peace and justice throughout the world. The covenant was prepared and signed by the convention which met at Paris in 1919 to formulate a treaty between the Allied Powers of one part and Germany of the other part. All responsible nations were represented at the convention and the scope of the League is worldwide.

The first suggestions for a league of nations were offered by President Wilson of the United States in 1918, as one of the "fourteen points" which he believed essential to end the Great War and assure peace to the world.

The first draft of the covenant was published in March, 1919. It was discussed by the various nations and returned to the convention for a few changes. Those changes were made and the document in completed form was given to the world in April. It is known officially as the *Covenant of the League of Nations,* and it forms Part I of the Treaty of Versailles (which see). The constitution is as follows:

Article 1. Members.

The original Members of the League of Nations shall be those of the Signatories which are named in the Annex to this Covenant and also such of those other States named in the Annex as shall accede without reservation to this Covenant. Such accession shall be effected by a Declaration deposited with the Secretariat within two months of the coming into force of the Covenant. Notice thereof shall be sent to all other Members of the League.

Any fully self-governing State, Dominion or Colony not named in the Annex may become a Member of the League if its admission is agreed to by two-thirds of the Assembly, provided that it shall give effec-

tive guarantees of its sincere intention to observe its international obligations, and shall accept such regulations as may be prescribed by the League in regard to its military, naval and air forces and armaments.

Any member of the League may, after two years' notice of its intention so to do, withdraw from the League, provided that all its international obligations under this Covenant shall have been fulfilled at the time of its withdrawal.

Article 2. Organization.

The action of the League under this Covenant shall be effected through the instrumentality of an Assembly and of a Council, with a permanent Secretariat.

Article 3. Assembly.

The Assembly shall consist of Representatives of the Members of the League.

The Assembly shall meet at stated intervals and from time to time, as occasion may require at the Seat of the League or at such other place as may be decided upon.

The Assembly may deal at its meetings with any matter within the sphere of action of the League or affecting the peace of the world.

At meetings of the Assembly each Member of the League shall have one vote, and may have not more than three Representatives.

Article 4. Council.

The Council shall consist of Representatives of the Principal Allied and Associated Powers, together with representatives of four other Members of the League. These four members of theLeague shall be selected by the Assembly from time to time in its discretion. Until the appointment of the Representatives of the four Members of the League first selected by the Assembly, Representatives of Belgium, Brazil, Spain and Greece shall be members of the Council.

With the approval of the majority of the Assembly, the Council may name additional Members of the League whose Representatives shall always be members of the Council; the Council with like approval may increase the number of Members of the League to be selected by the Assembly for representation on the Council.

The Council shall meet from time to time as occasion may require, and at least once a year, at the Seat of the League, or at such other place as may be decided upon.

The Council may deal at its meetings with any matter within the sphere of action of the League or affecting the peace of the world.

Any Member of the League not represented on the Council shall be invited to send a Representative to sit as a member at any meeting of the Council during the consideration of matters specially affecting the interests of that Member of the League.

At meetings of the Council, each Member of the League represented on the Council shall have one vote, and may have not more than one representative.

Article 5. Voting.

Article 5 provides that all decisions excepting those on questions of procedure, appointment of committees and decisions otherwise provided for by terms of the Treaty, shall require a unanimous vote in the Assembly and the Council, excepted questions may be decided by a majority of the number of the League represented at the meeting.

This article also provides that the first meeting of the League shall be called by the President of the United States.

Article 6. Secretariat.

The permanent secretariat shall be established at the seat of the League. The Secretariat shall comprise a Secretary General and such secretaries and staff as may be required.

The first Secretary General shall be the person named in the Annex; thereafter the Secretary General shall be appointed by the Council with the approval of the majority of the Assembly.

The Secretaries and staff of the Secretariat shall be appointed by the Secretary General with the approval of the Council.

The Secretary General shall act in that capacity at all meetings of the Assembly and of the Council.

The expense of the Secretariat shall be borne by the Members of the League in accordance with the apportionment of the expenses of the International Bureau of the Universal Postal Union.

Article 7. Place of Meeting.

This article establishes the seat of the League at Geneva, Switzerland, but gives the Council power to establish it elsewhere, and declares all positions in the League and the Secretariat open equally to men and women.

All representatives of the League enjoy diplomatic privileges and immunities, and buildings and other property occupied by the League, its officials and representatives are to be inviolable.

Articles 8 and 9. Disarmament.

These articles require national armaments to be reduced to the lowest point consistent with national safety. It decrees that the council, taking into consideration the conditions of each nation, shall formulate plans for such reduction for the consultation and such places are subject to revision at least every ten years. After the plans shall have been adopted, the various governments cannot exceed the limits of the armament therein provided for, without the concurrence of the Council.

The article also provides for regulating the manufacture and sale of munitions of war.

Article 9 provides for a permanent commission to advise the Council on the provisions of Articles 1 and 8, and on military, naval and air affairs.

Article 10. Territorial Integrity.

The Members of the League undertake to respect and preserve as against external aggression the territorial integrity and existing political independence of all Members of the League. In case of any such aggression or in case of any threat or danger of such aggression the Council shall advise upon the means by which this obligation shall be fulfilled.

Articles 11-13-15. Arbitration.

These articles recognize any war or threat of war, whether affecting any member of the League or not, as a matter of concern to the whole League and require the League to take any action it may deem effectual to safeguard the peace of nations. Members of the League agree to submit to arbitration or to the Council any question that may arise between them, that is likely to lead to a rupture and cannot be settled by diplomacy. The Council shall report on such question within six months and the members submitting the question agree that they will not resort to war for three months after receiving the award of the commission of arbitration or the report of the Council.

The members of the League further agree that they will accept and faithfully carry out any award that may be rendered on questions which they voluntarily submit to arbitration, or the Council for adjustment.

Article 15 provides for bringing before the Council disputes arising between members of the League that have not been submitted to arbitration in accordance with the provisions of Article 13. In case a dispute referred to the Council is found according to international law to pertain to a matter lying within the domestic jurisdiction of the member submitting it, the Council shall so report and shall make no recommendation as to its settlement.

Article 14. International Court.

The Council shall formulate and submit to the Members of the League for adoption plans for the establishment of a Permanent Court of International Justice. The Court shall be competent to hear and determine any dispute of an international character which the parties thereto submit to it. The court may also give an advisory opinion upon any dispute or question referred to it by the Council or by the Assembly.

Article 16. War.

Should any Member of the League resort to war in disregard of its covenant under Articles 12, 13 or 15, it shall ipso facto be deemed to have committed an act of war against all other Members of the League, which hereby undertake immediately to subject it to the severance of all trade or financial relations, the prohibition of all intercourse between their nationals and the nationals of the covenant-breaking State, and the prevention of all financial, commercial or personal intercourse between the nationals of any other State, whether a Member of the League or not.

It shall be the duty of the Council in such case to recommend to the several Governments concerned what effective military, naval and air force the Members of the League shall severally contribute to the armed forces to be used to protect the covenants of the League.

The Members of the League agree, further that they will mutually support one another in the financial and economic measures which are taken under this Article, in order to minimize the loss and inconveniences resulting from the above measures, and that they will mutually support one another in resisting any special measures aimed at one of their number by the covenant-breaking State, and that they will take the necessary steps to afford passage through their territory to the forces of any of the members of the League which are co-operating to protect the covenants of the League.

Any Member of the League which has violated any covenant of the League may be declared to be no longer a Member of the League by a vote of the Council concurred in by the Representatives of all the other members of the League represented

Article 17. Disputes with States Not Members of the League.

This article provides that in the event of a dispute between a Member of the League and a State not a member of the League, or between States not Members of the League, the State or States shall be invited to accept obligations of membership in the League for the purpose of settling the dispute. If such invitation is accepted, the provisions for settlement of disputes between Members of the League are to be applied, with such modifications as the Council may deem best. If the State shall refuse the invitation and resort to war, the provisions of Article 16 shall be applicable to such State.

Article 18-20. Treaties.

These articles provide:

1. That all treaties or international engagements entered into hereafter by any member of the League shall be registered with the Secretariat and shall be published as soon as possible. No treaty or international engagement shall be binding until so registered.

2. That the Assembly may, from time to time, advise the reconstruction by members of the League of treaties and international relations whose continuance might endanger the peace of the world.

3. That the acceptance of the Covenant of the League of Nations abrogates all obligations or understandings inconsistent with the terms thereof.

Article 21. Monroe Doctrine.

Nothing in this Covenant shall be deemed to affect the validity of international engagements, such as treaties of arbitration or regional understandings like the Monroe Doctrine for securing the maintenance of peace.

Article 22. Mandatories.

This article provides for the government of colonial territories which as a consequence of the war had ceased to be under the government of the nations to which they formerly belonged and were inhabited by such peoples as are not yet able to stand by themselves. The character of each mandate shall be adapted to the stage of development of the people and the geographical conditions of the territory to which it is applied.

Article 24. International Bureaus.

This article provides for placing under the direction of the League all international bureaus already established by general treaties, if the parties to the treaties consent. All such bureaus and commissions hereafter established are required to be placed under the direction of the League.

Articles 25, 26, Red Cross; Amendments.

In Article 25 the League agrees to promote the establishment of the Red Cross. Article 26 provides that amendments to the Covenant become effective when ratified by the Council and a majority of the Assembly.

The Covenant was signed by all the powers represented in the Convention. Probably no power was fully satisfied with it, but all realized that each nation must yield some points for the benefit of the others and all believed that the covenant was a good beginning towards a world-wide peace.

The League of Nations encountered strong opposition in the United States Senate. Most of the Republican Senators and some of the Democrats believed that it did not adequately safeguard the interests of the country, and the two-thirds vote necessary to the ratification of the treaty could not be secured, notwithstanding a number of "reservations" designed to remedy the defects were adopted. The chief objections were to Article X and to the provision which granted the British empire six votes in the Assembly to one vote for each of the other countries.

THE FIRST MEETING. The first meeting of the League convened at Geneva, Switzerland, Nov. 20, 1920. Delegates representing forty-one nations, with a total population of over two-thirds of all the inhabitants of the earth, were present. Paul Hymans, Belgian Minister of Foreign Affairs, was elected President of the Assembly. The session lasted five weeks. Among the important measures sanctioned were: Authorizing the sending of troops to Lithuania to supervise the plebiscite at Vilna; establishing an International Court of Justice, and the appointment of a commission on disarmament.

WHAT THE LEAGUE HAS ACCOMPLISHED. During its existence, fifty-four nations have adhered to it and, notwithstanding the great difficulties under which the League began its labors, its accomplishments have been of the greatest value. For the first time in history it has formed an organization which the world generally recognizes as having a common moral responsibility for the preservation of peace and a procedure to make that responsibility effective.

The first great problems confronting the League were those directly associated with the Treaty of Versailles and of these problems the most perplexing were those pertaining to the mandatories allotted to different nations. It was for the League to develop a plan of administration for these regions which would assure the inhabitants fair treatment and the liberty to which they were entitled. Because of numerous perplexing racial and commercial difficulties, some of these mandatories were not approved until the meeting in September, but in the end all were satisfactorily adjusted.

Another difficult problem was the administration of the Saar Basin. This region was taken over by France for fifteen years in order that that country might be supplied with coal, because the Germans had destroyed the French coal mines. It was evident that neither a German nor a French administration would be satisfactory. Therefore the League consummated a plan which has worked smoothly and successfully. The region is inhabited by about six thousand people and at the end of the fif-

teen years the inhabitants are to determine by a plebiscite whether they will remain in German territory or join France.

In a number of instances the League has acted successfully in the arbitration of international disputes. In 1921 the League settled a dispute on the part of Italy, Greece and Jugoslavia as to the boundary of Albania. It also determined the possession of the Aaland Islands, claimed by Finland and Sweden. It has settled a boundary dispute between Hungary and Czechoslovakia, and late in 1925 prevented war between Greece and Bulgaria. In the dispute of Poland and Lithuania over the possession of Vilna, owing to the unyielding attitude of both parties, the League was unable to adjust the difficulty but it has since adjusted itself by the union of Vilna with Poland. The upper Silesia question was perhaps the most menacing of all, since the plebiscite for the division of territory between Poland and Germany was conducted under such regulations as to make it well nigh impossible to determine the result, and a local war was imminent. Owing to a deadlock between the premiers of Great Britain and France over the question, an adjustment seemed impossible until the League assumed the responsibility. The work of adjustment was arrived at and hostilities were avoided.

Germany became a member of the League September 8 ,1926, and with this membership the Locarno Treaty became effective.

One of the greatest services to the world which the League has rendered is found in the establishment of the Court of International Justice (which see) which is open to all nations.

The humanitarian adjustments are no less important, although but little mention has been made of them. For years it has been impossible to stop the sale of opium, because no international agreement could be reached. The League has taken this matter in hand and through the international commission is securing the cooperation of the different nations The traffic is already being reduced and it is reasonable to suppose that in the near future it will be practically suppressed.

The League has also been active in solving problems pertaining to international health. This again was a problem that needed the cooperation of the various nations. At the time of the first meeting of the League there was an epidemic of typhus in Poland which had been introduced from Russia. The unrestricted movements of the population from one country to another was rapidly spreading the epidemic. The League secured international cooperation and the epidemic was checked. From 1920 to 1921 the cases of typhus in Poland fell from 157,000 to 45,000, and in Russia from 3,000,000 to 600,000; in Rumania from 45,000 to 4,800. A permanent health commission has been organized and steps have been taken to secure standardization of serums and all new remedies. Plans are being perfected for the interchange of sanitary experts, among the different countries, and for the closest cooperation of the important sanitary organizations of Europe. These plans are expected to result in the making of international health reports and the establishment of sanitary health laboratories.

Leamington, Ontario, the southernmost town in Canada, is situated on Lake Erie, thirty miles southeast of Windsor. It is served by the Pere Marquette and Michigan Central railroads, has interurban connection with Windsor, and has steamer service to Pelee Island. Leamington has the largest early vegetable hothouse in Ontario, and has manufactories of tobacco products, baskets, veneer, foundry products and sashes and doors; and the Canadian branch factories of the Heinz Company of Pittsburgh, are located here. The educational system is modern, comprising primary and secondary schools and a Carnegie library. The municipality owns a beautiful fifteen-acre park on the lake. Leamington had a population of 3,675 in 1921.

Leander. See HERO AND LEANDER.

Leaning Tower of Pisa. See PISA.

Leap Year. See CALENDAR.

Lear. See KING LEAR.

Lease, the contract or conveyance for the possession of land or buildings and the profits therefrom for a specified period of time. Of the two parties to such a contract, he who grants the lease is termed the "lessor," while he to whom it is granted is the "lessee," or tenant. Usually, the tenant pays for his lease with money, though if so specified, he may pay in produce or other valuables. A long term lease gives the tenant more privileges than does a short term lease, as he is under this kind of lease almost the owner of the property. Leases are often made for life, and terminate only with the death of the tenant. In a written lease, which is necessary when the time is more than one year, the specifications, dates, rent and a description of the property, are named.

Leather, the skin of an animal dressed by a process called tanning. The skins of the cow, ox, buffalo, elephant, and other large, thick-skinned animals are called hides, as distinguished from the skins of calves, sheep, goats, dogs, and fur-bearing animals. Kip leather is produced from the hide of a half-grown animal. Green hides are rubbed with salt to prevent putrefaction, or else they are dried before they are sent to market. Both green hides and dried hides may be converted into glue by boiling. So far as the art of tanning is concerned, all skins and hides consist of three layers,—the outer or epidermis, including the hair; an inside fleshy, fatty layer; and a third, or intermediate layer between the two, out of which leather is made. The preparation of leather consists of two entirely distinct processes. First, getting rid of the hair and the flesh; second, filling the central layer with curative and preservative material. Skins valued for their fur are, of course, dressed and tanned from the flesh side only.

There are many ways of removing the hair and fat. One of the simplest consists of laying the hides in a bath of milky lime-water for from two to twenty days, which loosens the epidermis and hair, and forms a kind of soap with the fatty matter. During this process the hides are turned over frequently and are churned about to make sure that the lime reaches all parts. Working or handling, as it is called, also assists in breaking up the epidermis and fatty cells. When taken out of the lime bath, the hides are scraped both inside and out with knives until nothing is left but the fibrous portion of the hide. The skins are now ready for the real process of tanning which converts them into leather. This may be done by immersion in a vat containing liquor strongly impregnated with tannin,—a strong coffee-like liquid obtained from the ground bark of oak, hemlock, birch, beech, or from the leaves and shoots of the sumac. The wood of a tree found in Argentina yields a fourth of its own weight of tannin. The more the hides are handled during this process, the more flexible and soft the leather. This treatment is continued for from one to six weeks, and then the hides are shifted into a second vat containing a still stronger decoction of tannin. To obtain the best results, the tanning process should continue for eight or ten months. After this the skins are worked thoroughly over a beam, and are shaved carefully on the flesh side to a uniform thickness. They are then filled with a mixture of oil, soap, and tallow, thoroughly worked in by a prolonged tumbling about in a revolving drum. There are shorter methods, but they do not produce as durable leather.

Leathers intended for the uppers of boots and shoes are blackened on the hair surface with a mixture of lampblack and oil or tallow. The treatment of sole leather, intended for the soles of boots and shoes and similar purposes, is more simple, as a less degree of flexibility is desired. In place of tannin from vegetables, a tanning solution is made of certain minerals compounded of alum, salt, sulphur and other elements. Well tanned leather is flexible, soft, tough, and proof against all forms of bacteria; that is to say, it will not putrefy under any circumstances. Leather exposed to moisture, however, especially in a dark place, will mold.

Tanning is at bottom any process that renders the fiber proof against the attacks of bacteria; that is to say, against putrefaction. This may be accomplished also by a process called oil tanning. Oil-tanned

leather is leather in which the tanning bath is omitted. The skins are pounded, rolled, and pressed in oil until every particle of animal matter capable of putrefaction has been driven out and replaced by preservative oils, chiefly those of the whale or cod. The Indians tanned their buckskins by filling them with the oily brains of the deer.

Chamois leather is tanned in oil. Morocco leather is tanned with sumac and stained with dye. Patent leather is made by splitting a skin into thin layers and coating them with a varnish of linseed oil containing lampblack and some other coloring matter, as Prussian blue. Parchment is made from the skin of sheep from which the flesh and hair have been removed in the usual manner. It is then stretched on a frame, and putrefying matter which it contains is absorbed by powdered chalk, after which the surface is smoothed with pumice and scraped with a steel blade. The skin is then dried and smoothed into shape. Vellum is made in a similar manner. Making leather is an ancient art preceding the dawn of history.

While leather manufacture is an ancient industry, which had seemingly reached the highest degree of efficiency centuries ago, to judge by existing specimens of old leather, the modern chemist is still working on the problem or speeding up production and decreasing cost without lowering the quality. When the European war broke out in 1914, the chemists of Great Britain, especially Professor H. R. Procter and the leather department of the University of Leeds, were largely the factor which made it possible to supply the enormously increased demand for the military equipment of the allied armies, including boots and shoes, belts, leggings, saddlery, traces, dressed sheepskins, and numerous minor requirements, besides the driving belts of the munition factories. There was similar activity and efficiency among the leather manufacturers of the United States when a like demand was made upon them in 1917; and with such an urgent demand to meet, the price of leather for furniture, baggage cases, gloves, bookbinding and parchment was naturally high.

In 1920 the manufacture of tanned, cured and finished leather in the United States occupied 680 tanneries, employing 72,476 people, and the product for the year was valued at $928,591,701. There were also 172 establishments engaged in the manufacture of leather belting, with a product valued at $40,000,000; 1,823 manufacturers of saddlery and harness, product $84,000,000; 503 manufacturers of leather goods "not otherwise specified," product $52,952,772; and 1,500 manufacturers of leather boots and shoes, with a product amounting to over $1,250,000,000, not to mention the numerous factories producing trunks and valises, and small hand bags, all of which consume leather in large quantities.

Processes. The processes whereby raw hides are converted into useful and durable materials by treatment with various solutions of substances of animal, vegetable and sometimes mineral origin, are distinctly chemical processes. Thus the hydrochloric acid washing often given to hides that have been unhaired by lime, to free them from that substance, is a scientific operation, calling for chemical investigation of the water supply, the quality of the water being important. The science of bacteriology has rendered valuable assistance to the tanner, by increasing knowledge of the process of softening hides prior to tanning; and artificial infusions of bacteria are now used for treating unhaired and washed hides, instead of former methods that involved the use of unpleasant substances with an offensive odor.

Kneading skins and hides with fatty substances was the oldest method of treating them for the purpose of preservation in a flexible state, and this method survives in the treatment of chamois leather with oil. Next came vegetable tanning, which is still extensively used, as described heretofore, and up to the end of the eighteenth century the prepared hides were simply soaked in a strong infusion of oak, willow or some other tan bark. Then Seguin, a Frenchman, introduced the method of soaking the hides successively in tan liquor of increasing strength, and the quality of leather was increased thereby. Sir Hum-

phrey Davy, by his investigation, further improved the methods of tanning, and then the stage of mineral tannages was reached, with alum as the pioneer substance of this kind. Salts of the metals iron and chromium have been used for tanning, and although iron salts are not used at the present time, chrome leather tanning is a very important industry, founded and developed upon scientific knowledge. Chrome tanning produces a soft and durable leather which will fix an acid dye without a mordant.

Artificial Leather. Many useful substitutes for leather are now available for various purposes, such as the upholstering of furniture and motor-car bodies, automobile and buggy tops, and bookbinding. Artificial leather is made in many grades and all kinds of leather are successfully imitated with a fabric that, while not as durable as real leather, closely resembles it in appearance and has lasting qualities that are satisfactory for the purposes to which it is applied. Some of the artificial leathers have well-known trade names.

Artificial leather is made by coating a cloth or other fabric with a thick solution of pyroxylin, a nitrated cotton, in proper solvents, usually containing castor oil or a similar substance in addition to alcohol-ether. After the solvents have been evaporated by an air current, the surface of the coated fabric may be embossed and finished ornamentally. The production of pyroxylin artificial leather in the United States before the World War exceeded 50,000 yards a day. A similar process is used for making patent and enameled leathers, a dope commonly used for this purpose being a mixture of 6/10 per cent pyroxylin, castor oil in wood alcohol, amyl acetate, fusel oil, and benzine. See Buckskin; Boots and Shoes; Glove.

Leatherstocking, the name given to Natty Bumpo, one of the principal characters in a series of romances by James Fenimore Cooper. The stories are called the Leatherstocking Tales from this character. Natty Bumpo is called also the Pathfinder, the Deerslayer, and Hawkeye.

In *The Pioneers, The Last of the Mohicans, The Prairie, The Pathfinder,* and *The Deerslayer,* figures the character of Leatherstocking, than whom no fictitious personage has a greater claim to interest. His bravery, resolution, and woodland skill make him a type of the hardy race who pushed westward the reign of civilization. —*Tuckerman.*

Leatherwood, Moosewood, or **Wicopy,** a North American shrub. It grows in rich, moist woods from New Brunswick to Minnesota and southward to the gulf. It is a much branched bush from two to five feet in height. The wood is soft and flexible. The bark is the toughest in the northern woods. It was much used by the Indians for thongs. Light yellow flowers precede the leaves and are followed in season by reddish oval drupes. The leaves are described by the botanist as alternate, flexible, obovate, and entire. A different species of leatherwood is found also in California.

Leavenworth, Kans., the county seat of Leavenworth County, is a prosperous industrial city situated on the Missouri River, 26 miles northwest of Kansas City. Leavenworth was founded in 1854 by the so-called "Sons of the South," not far from Fort Leavenworth, one of the most important military posts west of the Mississippi. The city was a center of pro-slavery influence during the agitation in Kansas over the slavery question. Near the city are valuable coal mines, and in the city are manufactured flour, grist, soap, brooms, wagons, washing machines, mine machinery, agricultural implements, etc. Near the city are the United States and state prisons, the National Military Home, and Fort Leavenworth, with a splendid infantry and cavalry school and a national military prison. Leavenworth contains fine schools and parks, and in a prominent place stands a large bronze statue of General U. S. Grant. Population in 1920, 20,000.

Lebanon, two limestone mountain ranges of northern Syria. The name signifies white. The ranges run parallel to the eastern shore of the Mediterranean. They inclose a valley drained by the upper course of the River Jordan. The range east of this valley is called Anti-Lebanon by way of distinction. The highest peak of Lebanon is about 10,000 feet high, higher than any peak in eastern North America.

The upper ridges are barren; the lower slopes and valleys afford tillage and pasturage. The fig, olive, and oak are seen. The famous cedars of Lebanon that once clothed the ranges in evergreen have been exterminated save a few venerable trees. Hyenas, wolves, jackals, foxes, and other wild beasts still lurk in rocky glens in the caverns in which a limestone range abounds. The northern part of the region is occupied by the Maronites, a sect of Christians; the southern by a turbulent sect, called Druses. There are also members of the Orthodox Greek Church, Catholics, and several thousand Mohammedans. See PALESTINE; JORDAN; DRUSES; CEDAR; DAMASCUS.

Lebanon, Pa., an industrial city and the county seat of Lebanon County, is 66 miles northwest of Philadelphia, on two railroads. The city lies in a fertile mountain valley, and iron from the Cornwall mine and limestone and brick clay from the hills contribute to the city's wealth. There are iron works, rolling mills, nut and bolt factories, blast furnaces, chain works, handkerchief, textile, shoe, silk and macaroni factories and brick-making plants. The city contains a Federal building, a fine court house, a public library, good schools, business college and a school of telegraphy. The population was 24,643 in 1920.

Lecky, William Edward Hartpole (1838-1903), a British historian. He was born near Dublin and died in London. He was graduated at Trinity College, Dublin. He began writing at an early day. His principal works are: *Leaders of Public Opinion in Ireland,* 1861; *History of the Rise and Influence of the Spirit of Rationalism in Europe,* 1861-5; *History of European Morals from Augustus to Charlemagne,* 1869; *History of England in the Eighteenth Century* — 8 volumes, 1878-1890; *Poems,* 1891; *Democracy and Liberty,* 1896; *The map of Life: Conduct and Character,* 1899. His historical reputation rests chiefly on the *History of England,* which, in 1893, was published in a new edition of twelve volumes. Much to the disappointment of Irish friends, Lecky developed into an opponent of home rule. He entered Parliament in 1895 as member for the University of Dublin. In Parliament he lost whatever democratic sympathies he may have had, and became a defender of the acquired privileges of the few, instead of an advocate of the needs of the many.

The chief objects of Pagan religions were to foretell the future, to explain the universe, to avert calamity, to obtain the assistance of the gods. They contained no instruments of moral teaching analogous to our institution of preaching, or to the moral preparation for the reception of the sacrament, or to confession, or to the reading of the Bible, or to religious education, or to united prayer for spiritual benefits. To make men virtuous was no more the function of the priest than of the physician. On the other hand, the philosophic expositions of duty were wholly unconnected with the religious ceremonies of the temple.—*European Morals.*

Leclaire, Edmé Jean (1801-1872), the originator of the profit-sharing wage system. Leclaire was a French house-painter, and in 1842 tried the plan of sharing his profits with the men whom he employed. A somewhat similar plan had been successfully employed by Lord Wallscourt, on his Irish estate a decade earlier, but had not been continued. Leclaire's system was not only successful during his lifetime, but was carried on with various modifications after his death, and is the beginning of the profit-sharing system in operation in several European countries, in Great Britain, and in the United States.

Lecompton Constitution, in the territorial history of Kansas, a pro-slavery constitution framed by a convention held at Lecompton September 5 to November 7, 1857. The convention was composed of delegates chosen by an election in which the anti-slavery men refused to take part on the score of illegality. The proposed constitution contained four clauses declaring the property rights of slaveowners inviolable and prohibiting the legislature from passing acts of emancipation. December 21, 1857, the constitution was submitted to vote in the form of "For the constitution with slavery," or "For the constitution without slavery," thus making sure of adoption in one form or another. The anti-slavery voters of the state very generally remained away from the polls. The

vote stood 6,143 for the constitution with slavery, with 569 votes against the slavery cause. Over half of the votes were cast in the precincts along the Missouri border, although the whole line of counties did not contain over a thousand legal voters. Excitement ran so high, and the legality of the entire procedure was so doubtful, that the territorial legislature met in special session and submitted the constitution as a whole January 4, 1858, at which date 10,226 votes were cast against it. Congress now took a hand and ordered the Lecompton Constitution submitted to a vote August 3, 1858. It was defeated by a majority of 10,000. The present constitution of Kansas was framed by a duly constituted convention July 5-27, 1859; it was adopted by popular vote October 4, 1859, and Kansas was admitted as a free state January 29, 1861.

Le Conte, Joseph (1823-1901), an American geologist. He was born in Liberty County, Georgia. His father, Lewis Le Conte, was a physician and a naturalist, the owner of a private botanical garden of note. Joseph was graduated at Franklin College, Georgia, and the College of Physicians and Surgeons, New York. He took up the practice of medicine at Macon, Georgia, but drifted into the companionship of Agassiz and accompanied that eminent naturalist to Florida in 1850. Le Conte held chairs of natural science and geology in Oglethorpe University, Franklin College, and the University of South Carolina. In 1869 he accepted the chair of geology in the University of California, a position which he honored. He died in the valley of the Yosemite. Le Conte was a product of the field, rather than of the laboratory. He wrote pleasingly. His *Elements of Geology,* published in 1878, went far to popularize geology in college classes. A smaller *Compend of Geology* performed a similar service in the high school and academy. Other writings were *Evolution: Its Nature and Its Evidence,* and *Religion and Science.* He was an editor of the *Journal of Geology and of Science,* to which he contributed valuable papers relating to mountain formations as manifested in the Sierra Nevadas.

Leda, lē'da, in Greek mythology, the wife of Tyndareus, king of Sparta. Zeus fell in love with Leda and used to visit her, disguised as a swan. Leda was the mother of Castor, Pollux, Helen of Troy, and Clytemnestra. She is represented in art with a swan by her side. See CASTOR AND POLLUX; HELEN; CLYTEMNESTRA.

Lee, Charles (1731-1782), British-American soldier who made for himself an unenviable reputation because of unsoldierly conduct at the Battle of Monmouth. He was born at Dernhall, Cheshire, England. He served in the British army for a time, accompanying General Braddock during his disastrous expedition against Fort Duquesne. He served England against Spain and Portugal, and for a short time was an officer in the Polish army. Emigrating to America in 1773, he finally became senior major general in Washington's army. In 1776, while in command of the Southern Department, General Lee was given credit for the defense of Charleston, S. C., while in fact the honor was due to William Moultrie, whose plan of defense General Lee had ridiculed. His actions were suspected from this time on, and his treason became apparent when he refused to attack the British left wing at the Battle of Monmouth, as commanded by his superior. The Americans were almost completely routed, the day being saved by Washington's arrival. General Lee was court-martialed for disobedience and suspended from his command for a year. Soon after he was dismissed from the army for addressing an impertinent letter to Congress.

Lee, Richard Henry (1732-1794), an American patriot. He was a native of Westmoreland County, Virginia. He was educated in England. On his return he became prominent in colonial affairs. In 1773 he was made a member of a committee to communicate with the other colonies relative to plans for common defense. He was a delegate to the first Continental Congress. He drafted the petition presented by that body to the king. He sat also in the second Congress, and was the mover of the famous resolutions that led to the Declaration of Independence. They should be familiar to every schoolboy. He

moved that "These united colonies are, and of right ought to be, free and independent states; that they are absolved from all allegiance to the British crown; and that all connection between them and the states of Great Britain is, and ought to be, totally dissolved." He served continuously, either in the legislature of his native state, or in Congress. He was not pleased with the Federal Constitution, but was one of the first two senators sent by Virginia to the Congress.

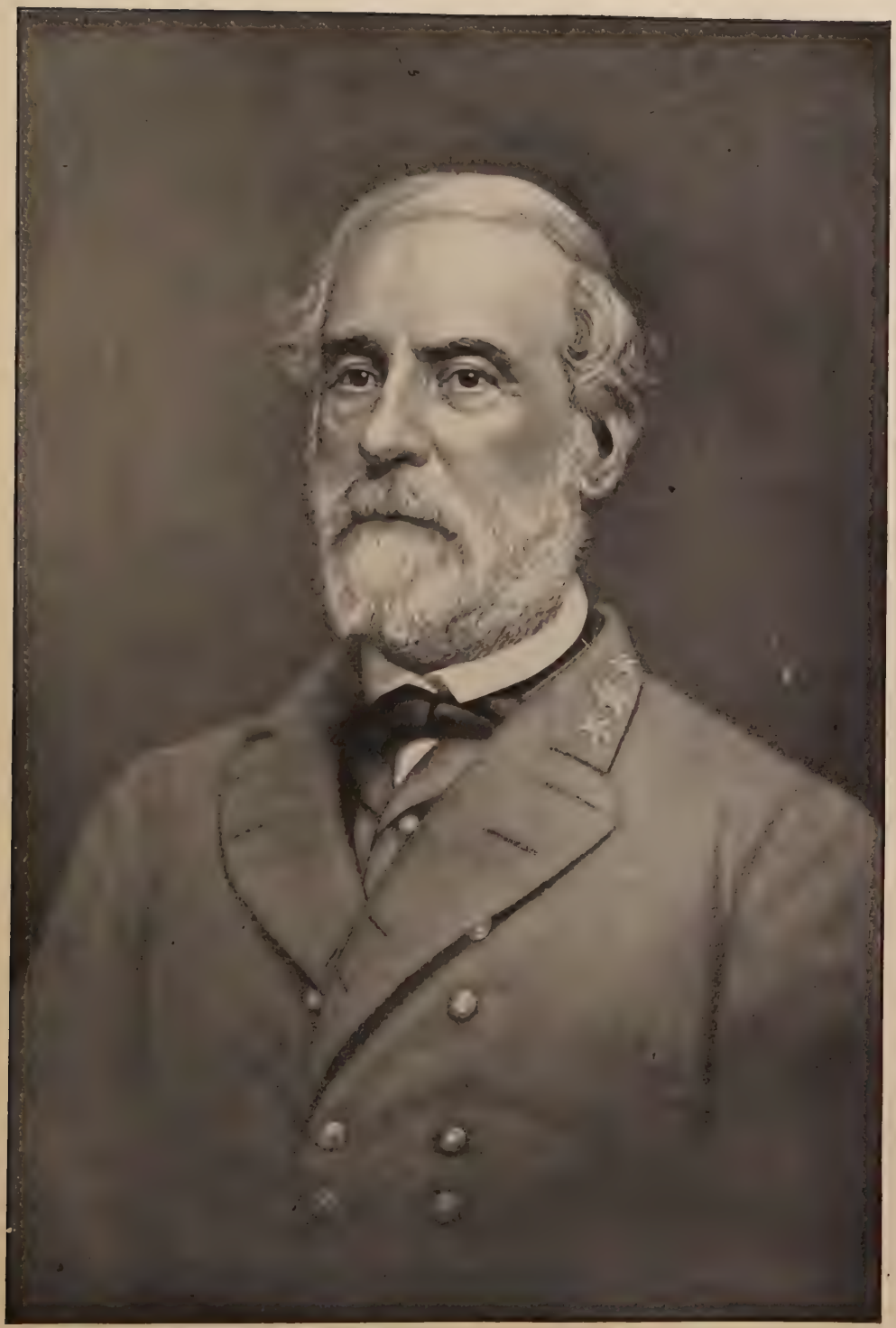
Lee, Robert Edward (1807-1870), an American soldier. He was a member of the famous Lee family of Virginia. The Lees were Cavaliers in the Old World, and supported the cause of the Stuarts and Governor Berkeley in the New. The Lees furnished two signers of the American Declaration of Independence and two representatives of the American colonies abroad. Henry Lee, known in his country as Light Horse Harry, was a match for the British Tarleton. Robert E. Lee, the subject of this sketch, was born in Westmoreland County, and received his elementary education in an academy at Alexandria. He completed the course at West Point in 1825. His conduct was a model of propriety. In scholarship he was second in his class. In 1832 he married Mary Custis, through whom he inherited the Arlington estates on the Potomac. He served in the Mexican War, making an excellent record. He entered as a captain. He was made major at Cerro Gordo, lieutenant-colonel at Churubusco, and colonel at Chapultepec. In 1852 he was made superintendent of the United States military academy at West Point. He saw service in the West in suppressing the Comanches, and had charge of the marines who took John Brown and his party prisoners at Harper's Ferry. When the Civil War came on he hoped that Virginia would not secede. President Lincoln offered him high command, but Lee sent in his resignation, feeling in duty bound to follow the flag of his native state. "With all my devotion to the Union, and the feeling of loyalty and duty as an American citizen," wrote he, "I have not been able to make up my mind to raise my hand against my relatives, my children, my home." After the war was over, he felt still that he had done right.

He was placed in command of the Virginia troops, and when that state joined the Confederacy he was given an important command. In 1862 he was assigned to the army of northern Virginia. He chased McClellan's army back from Richmond, routed Pope on the battlefield of Manassas, met McClellan at the battle of Antietam, and fought the battle of Fredericksburg. He suffered his great military reverse on the third day at Gettysburg. When Grant concentrated on Richmond for the last campaign with 275,000 well equipped and well fed men, Lee had but 70,000 ill provisioned troops, with which to oppose him; yet he fought the battles of the Wilderness and defended Richmond with a skill which won the admiration and the respect of his opponents. When his thin ranks had been reduced to the verge of starvation, and were literally in rags, he surrendered at Appomattox, April 9, 1865. When he rode into Richmond after the surrender, he received an ovation from the Federal soldiers such as they accorded only to favorites among their own generals.

Lee accepted the results of the war in good faith and strove to bring about a settled condition of affairs. Like Grant, he had no bitterness in his nature. In October of the same year he became president of Washington and Lee University at Lexington, a position which he held until his death. Virginia has ordered a statue of Lee, as one of two representative men, to be placed in the rotunda of the capitol at Washington. By North and by South alike, the choice is considered a fitting one.

See JACKSON.

Leech, or **Bloodsucker,** an animal of the earthworm type flattened on the lower surface and furnished with a sucker-like foot or disk on the under side of each extremity. Leeches have a singular power of lengthening and contracting their bodies. Their natural home is in swamps and sluggish water. Some are brown, others black. They are good swimmers but travel readily on shore. They have from one to five pairs of eyes. Leeches are of many kinds. Some



ROBERT E. LEE

physicians formerly prescribed the use of leeches in certain forms of disease, but other remedies have now superseded them.

Leeds, a large manufacturing city of Yorkshire. It is situated on both sides of the Aire. It has water communication with the sea by way of the Humber and is connected by canal with Liverpool. It is the center of a rich coal and iron district. There are the usual public buildings and municipal improvements. The river is spanned by eight bridges. The city has been noted for generations as the seat of the woolen manufactures of Yorkshire. Iron foundries, steel works, manufactures of tools, machinery, boots and shoes, and clothing have been added. Locomotives, tobacco, printed cloth, chemicals, glass, tiling, and pottery add to the population and business of the city. The region is noted for the production of flax. It is the most important seat of the English linen industry. The factories are on a large scale. A single room in one of the linen establishments is said to occupy over two acres. Leeds ranks with Sheffield, Manchester, and other large manufacturing cities in importance. The population for 1921 is given by the *Statesman's Year Book* at 458,320.

Leek, a plant related to the onion and garlic. Leeks have an offensive, distasteful odor, and a taste of their own, but suggestive of garlic. The wild leek has a naked flower stalk, four to twelve inches high, with a flat-topped cluster of greenish flowers. The leaves, five to nine inches long and one to two inches wide, come early in the spring when feed is scarce. Cows feeding on them give "leeky" milk unfit for use. The leek contains tiny globules of an essential oil. It is this oil that ruins butter and milk. The leek is to be found in rich woodlands. Leeks are an article of food in southern Europe. See ONION.

Legal Tender, money or other commodity which is recognized by law in payment of a debt. In the United States money is the only legal tender. Checks, drafts, jewelry, merchandise of any description, even land, may be refused by the person to whom payment is due. The exact change must be offered. The presentation of a twenty dollar gold coin in payment for a twenty-five cent dinner is not legal tender. The courts would hold that the customer had not offered to settle his bill. A debtor is not permitted to annoy his creditor by putting him to the inconvenience of accepting a large amount of small coin. Gold coins are legal tender in any amount, the rule as to exact change being observed. Silver dollars are legal tender for all debts, public and private, unless expressly excluded by contract. The small silver coins are legal tender in sums not exceeding ten dollars, and the five cent and one cent pieces are legal tender to the amount of twenty-five cents. Foreign money cannot be forced in payment of debts. United States notes, that is to say, paper money, are legal tender for all private debts, but the government may refuse to accept them in payment of duties. During the Civil War our government insisted on duties being paid in gold. The government also contracts to pay the interest on its public debt in gold. Notes issued by national banks are, with certain exceptions, legal tender. The question of legal tender is an important one in business. If, for instance, one's home were about to be sold under mortgage, and the holder of the mortgage desired to get possession of it, he is legally free to refuse a payment, even in excess of the amount due, unless the offer of the exact amount due be made in the form of money. See MONEY.

CANADA. Under the Dominion Currency Act, Canadian copper coins are legal tender to the amount of twenty-five cents, silver coins to the amount of ten dollars, and gold coins and Dominion notes to any amount. The British sovereign is legal tender for $4.86\frac{2}{3}$, and the half sovereign for one-half that amount. The American gold eagle is legal tender for $10.00, and halves and multiples of the American eagle for proportionate amounts. A resolution was passed by the Dominion government in 1921 making nickel coin legal tender to the amount of $5.

Leghorn Livorno, the third seaport of Italy. It is situated on the Mediterranean coast, midway between Genoa and Rome.

About 4,000 ships clear annually. The trade is chiefly with the Levant. Raw silk, olive oil, soap, candied fruits, wine, glass, paper, straw braid, coral ornaments, hemp, hides, marble, borax, and quicksilver are exports. The city is the original port of shipment for the famous leghorn hats. Foodstuffs, coal, spirits, and petroleum are bought abroad. The city is prosperous. Its ancient walls still stand. A fine lighthouse guides the way into a safe harbor. The warehouses are built along canals. Attractive suburbs make the city a popular summer resort. The communal population on January 1, 1915, was returned at 108,585.

Legion, in Roman warfare, a body of infantry. It corresponded roughly to the Greek phalanx and to the modern battalion. In Caesar's time the legion contained about 3,600 men. It was divided into ten cohorts of 360 each. Each cohort was divided into three maniples of 120 men each. Each maniple was divided into two centuries. Each legion was commanded by a lieutenant and six tribunes. These officers and their attendants were usually men of social standing. Each century was commanded by a centurion, chosen usually from the ranks. The first centurion was intrusted with the silver eagle. It was the standard of the legion. In camp, it was kept in a little shrine. Its loss in battle was the deepest disgrace that a legion could incur. Each maniple had also its standard. Orders were given by means of ensigns and by signals on wind instruments. There were three of these instruments, a funnel-shaped trumpet about three feet long with a deep tone, a large curved horn with a shriller note, and the shell horn with a hoarse note, pitched above that of the trumpet. Each legion was accompanied by a separate baggage train carrying tents, mills for grinding grain, artillery, extra weapons, and supplies of food.

In ordinary battle array, a legion was drawn up in three lines. The soldiers stood about three feet apart. Four cohorts stood in the first line in ranks from eight to ten men deep. About fifty paces in the rear, three cohorts were posted, and behind them again, three more cohorts. When the legion went into action the second line pressed forward. As soon as the first line fell, or became weary, the soldiers of the first line fell back behind their comrades for shelter; only in case of emergency was the third line brought into action. In his *Commentaries* Caesar speaks of using the third on one occasion to repel an attack of the Helvetii who fell unexpectedly upon his rear. Six legions, side by side in battle array, presented a front of about a mile or a mile and a half in length according to the size of the legions. It was not customary to reinforce a legion with new recruits. The older the legion, the smaller, therefore, it became.

The soldiers of the legion were recruited from the citizens of Rome, not from foreign mercenaries. Each soldier was clad in an undyed, thick, woolen tunic, reaching to his knees. He carried a cloak which served him, also, as a blanket. On his feet, he wore half boots or sandals with heavy soles. They were fastened by means of straps passing over the instep. As to defense, the legionary soldier wore a metal helmet, ornamented with a crest and a heavy cuirass or coat of leather, strengthened with strips of metal or metal scales. He carried also a rectangular or oval shield strengthened with leather and a rim of metal. For offense he carried a heavy pike or javelin. It had a square wooden handle four feet long with an iron point about two feet in length. Its total length was about six feet. It weighed about as much as an ordinary musket. The skillful soldier was able to hurl it and spit a man at a distance of about seventy-five feet. A second weapon was the sword,—a short two-edged pointed weapon adapted for thrusting, rather than for striking. Every fifteen days, an allowance of about thirty pounds of whole wheat was issued to each soldier. This he was expected to grind in a handmill and to prepare in person, either in the form of a paste or in unleavened bread. On the march, he made up his wheat, his cooking utensils, his blanket, and his tent stakes into a tight bundle, weighing from fifty to sixty pounds. When going into battle these impedimenta, as they were well called, were left in a pile under guard.

Legion of Honor, a French order of merit established by Napoleon in 1804.

Soldiers or others who had distinguished themselves received a star containing the emperor's portrait, surround by a wreath of oak and laurel and the words *"Napoleon, Empereur des Français."* On the other side was the French eagle bearing a thunderbolt in his claws and the legend, *"Honneur et Patrie,"* meaning honor and native land. The order has been reconstituted. A device emblematic of the republic has been substituted for the portrait of the Emperor. The words are now *"République Française 1807."*

Legislature, in the United States, the body of men in each state which makes the laws. State legislatures, like so many of our governmental institutions, are a heritage from England. In colonial times each colony had such a law-making body modeled upon the English Parliament; upon the adoption of the constitution the legislature became a vital part of every state. The technical name for it varies; in about half the states it is known as the "general assembly," in a few others as the "legislative assembly," while in Massachusetts and New Hampshire it is called the "general court." All of the state legislatures have two houses, the upper always called the "senate," and the lower, known usually as the "house of representatives."

A state legislature ought to be a very trustworthy and honorable body, for to it are delegated all the powers not expressly denied it by the federal constitution or the constitution of its own state. It controls the whole realm of common law, and so touches the citizen in respect to all his private rights, such as the ownership of property. It decides as to what misdeeds shall be made crimes, punishable by fine, imprisonment, or death. It controls the use of a man's property, and enjoys the right of taxing it. By the authority of the right known as "police power" it regulates all matters pertaining to the public health, morals, or general welfare. Under this police power, for example, a state can forbid the sale of cigarettes or intoxicating liquors.

CANADA. The Dominion Parliament is divided, like the English Parliament, into two chambers—the Senate, corresponding somewhat in function to the English House of Lords, and the House of Commons. The members of the Senate are appointed for life by the Governor-General-in-Council, and the members of the Commons are elected by popular vote. Two of the Canadian provinces, Nova Scotia and Quebec, have legislatures divided into two houses corresponding to the two houses of the Dominion Parliament; but in the other provinces the single house system obtains, the body being known as the legislative assembly.

Legume, a pod. Leguminous plants are literally all those whose seeds are borne in a pod; but the term is applied only to the pea family, including peas, beans, pulse, lentils, lupines, clovers, alfalfa or lucern, the peanut, locust, and laburnum. The whole family is valuable. The leaves and stems are good for fodder; the seeds are rich in food material; the roots run deep and pulverize the soil; the leaves take up nitrogen from the air—the same element that makes powder black—and send it down to nodules (colonies of bacteria) in the roots —to be converted into rich plant food. A farm is never impoverished by raising leguminous crops. See CLOVER; PEA.

Leibnitz, līp'nĭts, **Gottfried Wilhelm von** (1646-1716), a German philosopher and mathematician. He was a native of Leipsic. His father was a professor of law in the university. Young Leibnitz was a precocious lad. He could read Latin fluently at twelve. He studied at the University of Leipsic and at Jena. Being refused a degree at Leipsic on account of his youth, he went to Altdorf where he took his degree as doctor of law. Unlike most men who have become celebrated for learning, he was not a university professor. He entered the services of the Elector of Mainz, and later had charge of the electoral library at Hanover. He was afforded leisure for study and writing. He wrote many political pamphlets, visited the principal cities of Europe, formed the acquaintance of scholars, and was honored with membership in the leading learned societies. He divides honors with Newton as the discoverer of the differential calculus. Both seem to have worked out the system independently. He was one of the most noted philosophers

of the day. The student of the subject will come one day upon Leibnitz's theories of *Sufficient Reason,* the *Monad,* and *Pre-established Harmony,* too advanced for discussion here. As an instance of the influence of an idea working long after a man is dead, it may be stated that Napoleon was influenced to invade Egypt by a letter of Leibnitz a century old. Leibnitz is regarded as one of the world's great thinkers. See KANT; HERBART.

Leicester, lĕs'ter, a prosperous city in the north central part of England. It is the seat of the county of that name,—a region noted for coal, Leicester sheep, and as a hunting country. The city is noted for its manufactures of hosiery, boots and shoes, etc. The name is derived from the Latin, meaning camp of the legion, and is in itself a reminiscence of the period when the Romans occupied Great Britain. Remnants of Roman walls and other antiquities are still shown. The population of the city and its manufacturing suburbs was returned in 1921 at 234,190. Montfort, Dudley and other earls of Leicester were men of prominence in English history.

Leighton, Frederick, Lord (1830-1896), an English historical painter. He was born at Scarborough, and when only nine years old began studying art at Paris. After a period of study at Rome, he went to Berlin, where he entered the Royal Academy at fourteen. His father, a well-to-do physician, encouraged his studies by having him travel, and Leighton went afterward to Frankfort, Brussels, and Paris, where he spent four years painting, and studying in the galleries. When twenty-five he sent his first picture, *Cimabue's Madonna Carried Through Florence,* to the Royal Academy at London. It elicited great praise, and was purchased by Queen Victoria. Then followed *The Triumph of Music, The Fisherman and the Siren,* and *Romeo and Juliet.* For a short time he was a member of the preraphaelite school. In 1869 he became a member of the Royal Academy, and afterward was elected president of the society. *Orpheus and Eurydice* is a celebrated earlier painting. Probably the best known of his later works are *The Music Lesson* and the frescoes at the South Kensington Museum.

Leipsic, līp'sĭk, one of the most important commercial towns in Germany. Altitude, 387 feet; population, 1919, 604,380. It is situated in a wide plain near the union of three sluggish streams. When the German Empire was formed, 1870, Saxony was propitiated by fixing the seat of the imperial supreme court at Leipsic. In architecture the town has nothing of which to boast. A fine open marketplace has been preserved in the middle of the city. The old walls have been leveled and the ditches filled up, providing a ring of wide streets and promenades quite surrounding the old town and separating it pleasantly from encircling suburbs.

Leipsic is the seat of an ancient and renowned university much frequented by American students. It is the center of the book trade of Germany. There are 300 booksellers' shops and eighty printing presses in the town. Publishers in other cities aim to keep their books in stock at Leipsic. Once a year many hundred booksellers gather at the Leipsic book fair to buy, sell, exchange, and settle accounts. Leipsic is also the world's fur market. Several million dollars' worth of furs change hands here each year. The price paid the trapper in British America and the cost of a lady's sealskin coat are based on the price of fur at Leipsic.

Since the year 1180 at least, Leipsic has been noted for fairs. Goods were formerly brought by pack trains from every direction. Where the camel caravans of the Far East left off, the pack horses of the West resumed the carriage of goods. Twice a year files of merchants guarding their pack trains converged at Leipsic for sale and barter. Emperors and diets outlawed the robber barons who attacked and plundered. Risks were great; profits were high. Although these fairs are declining in importance, being replaced by traveling salesmen, from 20,000 to 40,000 people in all imaginable garbs still center at Leipsic at the time of the fall or the spring "messe." Lodgings are at a premium. The city is literally crowded, thronged. Population, 1919, 604,380.

Leland Stanford, Junior, University an institution of higher learning at Palo Alto, California. The site is picturesque.

It is situated in the Santa Clara Valley, about three miles from the Bay of San Francisco. The campus comprises 9,000 acres of land, rising to the foothills of the Santa Mareno Mountains. The institution was founded by Mr. and Mrs. Leland Stanford as a memorial to their only son, who died at the age of sixteen. It was opened to students October 1, 1891. It is a co-educational institution. The number of women who may attend, however, is limited to 500. The faculty numbers over 100. There are over 3,000 students in attendance. Tuition is free to residents of California. Non-residents pay a small registration fee. The institution is strictly undenominational. Affairs are managed by a board of trustees. The original endowment was about $30,000,000, which has been increased largely of late. The buildings are patterned after the old Spanish missions of California and Mexico. They are of buff sandstone with red tile roofs. They form two quadrangles one within the other. The inner quadrangle is composed of one story buildings. The outer buildings are two stories in height. There are the usual departments of college work, including engineering. Professional schools have not been established. Degrees are conferred three times a year, in May, September, and January. The buildings were injured by the earthquake of 1906. Beautiful statuary and decorations—works of art that can hardly be restored — were destroyed.

Leman. See GENEVA.

Lemay, Leon Pamphile (1837-), a noted Canadian poet and novelist, was born at Lotbiniere, Quebec, and received his education at the Quebec Seminary. After studying theology at the University of Ottawa, Mr. Lemay took up law, and was called to the bar in 1865. Two years later he secured the position of librarian to the Quebec legislature, from which he retired on a pension in 1892. In the literary field, Mr. Lemay first gained attention with a translation into French of Longfellow's *Evangeline.* Chief among his other works are *Les Vengeances, Poèmes Couronnés, Fables Canadiennes* and *Rouge et Bleu.*

Lemieux, Rodolphe (1866-), a Canadian attorney and statesman, was born at Montreal and educated at Nicollet Seminary and at Laval University. After graduation he engaged in journalistic and literary work for a time, and was called to the bar in 1891. From 1896 to 1906 Mr. Lemieux was a member of the law faculty of Laval University. In the latter year he secured election to the Dominion House of Commons for Gaspe, serving until 1911. In the Laurier Cabinet 1904-06, he was Solictor-General; was Postmaster-General from 1906 to 1911; and for a few months in 1911 was Minister of Marine and Fisheries. He was returned to Parliament again in 1917. In 1907 Mr. Lemieux was special immigration commissioner to Japan. With the return of the Liberals to power in 1921, he was appointed Speaker of the House of Commons. He published *Lemieux Law on Industrial Conflicts* and *History of French-Canadian Law.*

Lemming, a gnawing animal of the North. There are several species. The most celebrated is the Lapland lemming, confined to Lapland and Norway. It is about seven inches long, with half an inch of tail. It burrows in the earth, and makes its nest of moss. From four to eight young are produced twice a year. Its color is yellow with black markings. The lemming is really a large field mouse, although it is sometimes called the Norway rabbit. Its home is in the mountains of Scandinavia. Once in every four or ten years, whether driven by scarcity of food or fear of a severe winter no one has been able to determine, the lemmings leave their mountain home, gathering at the foot of eastern and western slopes. They take their way in long skirmish lines eastward to the Gulf of Bothnia, or westward toward the Atlantic. They travel by night and halt by day. Wherever they stop they devour everything eatable. They leave gardens and meadows and fields as bare as if overrun by fire. Although multitudes are killed by the inhabitants nothing will turn them back. They fight fiercely and cannot be diverted from their course. If they reach a rock they go around it; if a log, they climb over it. On reaching a river or narrow sea they swim directly across. If they encounter a floating log they climb over it rather than

change their direction, and men, birds of prey, water, fire, and starvation overpower all but a handful. There are several other lemmings, one in Central Asia and one in northern Russia. The Hudson Bay lemming is to be found near the bay of that name. Still further north is the Greenland lemming. A small species, five and one-half inches long, is found in the rocky regions of the Sahara. See MOUSE.

Lemon, a citrous fruit related to the orange. Like the orange, the lemon is a native of India but is less hardy and requires a situation with slight if any frost. The fine lemons of Europe are from Mediterranean countries. The best are from Sicily. Our lemon districts are Florida and California, but those of California are much more extensive. The annual production of lemons in the United States amounts to about 3,657,000 boxes, valued at about $2,500,000. Some lemons are still imported from Italy.

Lemons grow on small, spreading trees or shrubs about ten or fifteen feet high. The flowers hang in whitish clusters. Their fragrance is less heavy than that of orange flowers. Botanically, a lemon is a large berry. It resembles the gooseberry and the tomato in structure. The juice is used in cooling drinks and for flavoring. Oil of lemon, or lemon extract, is pressed from the rind. It is used for flavoring and as the basis of perfumes. As compared with a lemon, the citron has a thicker, more tender skin and less juice. The lime grows on a smaller tree, and is smaller than a lemon. Its sourness is tempered by a dash of bitterness.

The lemon is more acid than the orange. A good lemon is about one-fourth rind, one-fourth pulp, and one-fourth juice. From two to four per cent of the whole is sugar; from six to nine per cent is citric acid.

In Sicily the lemon crop is gathered by hand with ladder and basket. The pickers, boys, women, and men, earn from eight to forty cents a day. The harvest costs about seven cents a thousand.

See ORANGE.

Lemur, le′mur, a group of four-handed animals very closely allied to the monkey. There are some thirty species, all natives of Madasgascar. The largest is about as large as a cat, and has a tail much longer than the body. Lemurs live chiefly in forests, climbing trees with the agility of a squirrel, and subsisting in part, at least, on insects and small animals. In their movements they are as graceful and noiseless as a weasel. While undoubtedly related to the monkey, they are much more attractive and make less mischievous though not as intelligent pets. The lemur corresponds to the marmoset of Mexico and South America. See MONKEY.

Lena, one of the great rivers of Siberia. It rises near Lake Baikal. After forming a sharp angle far to the eastward, it flows into the Arctic Ocean through several mouths in latitude 72° N. Its entire course is 3,000 miles in length. It is navigable through the greater part of its course during the summer. The Lena lies entirely north of the fifty-second parallel. Its plains are open to the Arctic winds of winter, yet it is believed that its basin includes a large area of fertility that may at some time be tapped by railroads and yield an abundance of wheat, rivaling the Canadian Northwest. Yakutsk, near the eastern angle of the river, is the first city on its banks. The delta of the Lena is of interest in connection with the De Long expedition. It is in the valley of the Lena that the ivory of the mammoth has been found in such abundance. See DE LONG; SIBERIA.

L'Enfant, lŏn-fŏn, **Pierre Charles** (1755-1825), a French engineer, noted as the man who planned the city of Washington, D. C. He was born in France, but came to America with Lafayette in 1777 and was made chief of engineers by Washington. Though he designed many fortresses and public buildings, he is chiefly remembered for his work in planning the capital city. The $2,500 and a lot near the capitol awarded him by Congress he rejected with contempt; he spent most of his later years trying to obtain a larger reward for his services, but in vain. That Washington is one of the most beautifully laid-out cities in the world today is due largely to L'Enfant's genius.

Lenin, Nikolai, (1870-1924), leader of the Bolsheviki, who overthrew the Kerensky government in Russia in November, 1917. He was born at Simbrisk of a noble

family, and his real name is Vladimir Ilitch Ulynoff Lenine. He became leader of the radical Socialist party in 1890. He was elected to the Duma in 1905 but was expelled. At the outbreak of the Great War he escaped to Switzerland, but returned in May, 1917, and overthrew the government the following November. He was made Premier notwithstanding a severe illness. See Bolsheviki.

Leningrad. See Petrograd.

Lens, a transparent body, usually of glass, bounded by two curved surfaces, or by a curved surface and a plane. The name is derived from the lentil, which is shaped like a double convex lens. Lenses are of two sorts. Those that bring rays of light to an actual focus are called converging or convex lenses. They form a real image. Lenses that cause rays of light to diverge, as though they proceeded from a point, are called diverging or concave lenses. The former are bounded by convex surfaces and give a magnified image. They are known also as magnifying glasses. The origin of lenses is not clear. The British Museum has a ground rock crystal found by Layard in excavations at Nimrud. A simple magnifying glass is described by an Arabic writer of 1052. The invention of spectacles is credited to an Italian of about 1255. The combination of lenses to form a compound microscope is credited to an optician named Janssen of Holland, dating about 1590. Galileo invented the telescope in 1610. The largest lenses known are those made for modern telescopes. See Spectacles; Thallium; Telescope; Clark.

Lent, an annual fast of forty days preceding Easter Sunday. The word is Anglo-Saxon meaning the season of spring. It begins on Ash Wednesday and closes on Easter Sunday. In commemoration of Christ's fast of forty days, described in Matthew iv: 2, and as a preparation for Easter, the abstention from amusements and from the eating of hearty food is enjoined by the Greek, Roman Catholic, English, and Lutheran churches. See Good Friday; Easter Sunday; Mardi Gras; Carnival; Ash-Wednesday.

Lentil, a slight plant of the pea family. Lentil pods are short, broad, and very flat, containing two seeds. Lentils are a considerable article of food in the countries of the Mediterranean and the Orient. More people eat lentils than eat beans. Some are gray, others red. The mess of red pottage for which Esau sold Jacob his birthright is said to have been made of red lentils. The astronomer who ground a round piece of glass until it was thin at the edge and thick in the middle, like the familiar seeds that thickened his soup, called his new invention a lens or lentil.

Leo I, the Great, pope from 440-461. It was through his influence that Attila, the "Scourge of God," was induced to leave Italy without sacking Rome.

Leo X, pope from 1513-1521. He was a de Medici and an able pontiff. He expelled a number of petty tyrants from Italy and added their territories to the papal dominion. Like others of the de Medici family, he was a patron of the arts and literature. It was during his pontificate that bestowing indulgences reached its height, and the Reformation under Luther began.

Leo XIII, pope from 1878-1903. He was the successor of Pius IX.

Joachim Pecci was born in 1810 and began his education in 1815 at the Jesuit College at Viterbo, where he distinguished himself chiefly in the classics. Later he took the highest honors at the Gregorian University at Rome, and was ordained in 1837. His experiences during the following years in various administrative capacities and as apostolic delegate, were invaluable to him. In 1843 he became titular archbishop, but three years later removed to Perugia as bishop, where he was made cardinal in 1853. Here he resided till 1878, when the Conclave by more than two-thirds vote chose him as Pope. Immediately upon his accession he made himself felt as a power in the world's affairs. He was a harmonizer of conflicting elements in the church and greatly strengthened its unity. His attitude toward America and the large catholic constituency there was most appreciative.

Leominster, Massachusetts, an important industrial city, is 45 miles northwest of Boston, on the Boston & Maine and the New York, New Haven & Hartford railroads. Since shortly after it was settled, in 1725, Leominster has been a center of

the celluloid and horn specialty industry, and is known locally as the "comb city." Other important manufactures are hairpins, toys, jewelry, shirts, baby carriages, pianos, furniture and buttons. The public school system of the city is modern and adequate, and is supplemented by a Carnegie library. Population, 1920, 19,744.

Leonardo da Vinci. See VINCI.

Leonidas. See THERMOPYLAE.

Leopard, lĕp′ĕrd, a large, catlike animal of the Old World, also called the pard and panther. Among the cats of the Old World it is exceeded in size by the lion and the tiger only, but it is smaller than the American cougar and jaguar. It ranges throughout the wooded country of North Africa and southern Asia to Japan and Java. Its length is about seven feet including the tail. The color is tawny, somewhat paler below, marked with regularly disposed black spots, having a rosette or broken appearance. The spots of the leopard are proverbial. The spotted leopard is a common emblem in modern heraldry.

Leopold, the name of two Belgian kings, father and son, whose conduct of state affairs was antithetical.

Leopold I [George Christian Frederic] (1790-1865), was the son of Francis, Duke of Saxe-Coburg, and was an uncle of Queen Victoria of England. He was born at Laeken; received an excellent literary and scientific education; and as a cavalry general served in th Russian army in 1805, winning the favor of Emperor Alexander I. In 1816 Leopold married Princess Charlotte, a daughter of King George IV of England. She died one year later. After refusing the Greek throne, Leopold was elected King of Belgium in 1831. In 1832 King Leopold married Princess Louise, a daughter of Louis Philippe of France. Leopold was a prudent, firm, and moderate ruler, whose only interest was Belgium and the Belgians. He was succeeded by his son, Leopold II.

Leopold II [Louis Philippe Marie Victor] (1835-1909), ascended the throne upon the death of his father in 1865. In 1853 he had married Marie Henriette, a daughter of the Archduke Joseph of Austria. In 1876 Leopold II organized at Brussels the African International Association with a view to profiting by recent African discoveries. He financed and otherwise facilitated Stanley's expedition to the Congo. In 1885 Leopold II secured control of the Congo Free State. His iniquitous practices in administering his African colonies exposed Leopold II to severe and deserved foreign criticism in 1905-06, and it is known that he led a dissolute personal life. He was succeeded by his nephew, Albert I.

Leprosy, an infectious disease due to a minute parasitic plant, called the bacillus of leprosy. It is not considered hereditary. Leprosy is transmitted from one person to another by actual contact with a diseased body. Leprosy is described in the books of Moses. It was formerly prevalent throughout Europe, but is now confined to isolated cases in Norway, Sweden, and Hungary. Although a hard thing to do, civilized communities exclude lepers from communication with their friends. A lazaretto, or hospital for lepers is maintained at Bergen, Norway. There is a settlement on the Gulf of St. Lawrence, and in the Hawaiian Islands, where the disease is prevalent, the island of Molokai being set apart for lepers.

Within a recent period chaulmoogra oil has come to be looked upon as a palliative, if not a complete cure, for leprosy. Cases are on record, where the disease has been arrested through the systematic and intensive use of this oil, or the active principles contained therein. In a recent report by the United States Health Service it is stated that more time is necessary before the alleged cures can be pronounced permanent. Of cases paroled from the leprosy stations in the Hawaiian Islands, only about eight per cent have thus far returned for treatment. See DAMIEN.

Lesage or **Le Sage, Alain René** älăn renā′le säzh′ (1668-1747), a French novelist and dramatist. He was born at Sarzeau, Brittany. He was educated at Paris for the law, but soon turned his attention to literature. He achieved no success, however, until he was forty years old, when the two plays, *Crispin Rival de Son Maitre* and *Turcaret*, won him reputation as a play-

wright. His most famous work is the novel, *Gil Blas de Santillane,* which has become a classic. See GIL BLAS.

QUOTATIONS.

It may be said that his wit shines at the expense of his memory.

Facts are stubborn things.

Les Misérables, lā-mē-zā-rā'ble, a novel by the French author, Victor Hugo. The title means, "the miserable ones," and the story gives a picture of life among the poor of Paris. It was published in 1860. It has been translated into twenty-one languages.

Lesseps, Ferdinand de (1805-1894), a French diplomat and engineer. He was born at Versailles, November 19, 1805, and died December 7, 1894. He was influentially connected and well educated. In 1828 he entered the consular service of France. From 1832 to 1838 he was stationed at Cairo. Happening on a report made to Napoleon by one of his engineers, Lesseps evolved the idea of the Suez Canal. In 1848 he was ambassador to Madrid. In 1854 he was invited to Egypt by Said Pasha to formulate plans for the Suez Canal. This work was begun under his supervision in 1859 and was carried to completion in 1869. He also planned a canal across the Isthmus of Panama and formed a company for its construction. The French government voted him large bonuses and shares of stock were sold to the public. Although his management of the Suez Canal was considered a great success, he was less fortunate in the conduct of the latter enterprise. Funds were misappropriated, his workmen fell ill, machinery was abandoned in the ditches, expensive plans involving the expenditure of immense sums of money were carried out in part and then abandoned. In 1889 he was tried for embezzlement of funds and bribery, and was condemned to imprisonment. The sentence was imposed rather to appease the popular mind than from any belief in his actual guilt. It was never carried into effect. He was a member of the French Academy and wrote a number of scientific reports of value. He is regarded still as a man of ability, whose later career became involved in unforeseen misfortunes. See SUEZ; PANAMA.

Lessing, Gotthold Ephraim (1729-1781), a celebrated German dramatist and critic. As literary productions his writings rank with those of Goethe and Schiller. Among those whose influence has been of importance to the literature of Germany, no name is greater than that of Lessing. As Luther gave to Germany a national language, so Lessing gave to Germany a national literature, completing the work begun byKlopstock in freeing writers from foreign models.

Lessing was born at Kamenz in upper Lusatia. He was descended on both sides from long lines of Lutheran pastors. His own father was a clergyman who placed his son in a school at Meissen when he was twelve years old, and later sent him to the University of Leipsic. At Meissen the master described the boy's ability by saying that he was "a horse that must have double fodder." He studied Latin, Greek, and modern languages, and was proficient in mathematics. To Leipsic the seventeen-year-old boy was sent to study theology. As a matter of fact he devoted his time to general literature and to the theater. In Leipsic society he was considered a brilliant youth. He took lessons in fencing, riding, and dancing.

In 1748 Lessing went to Berlin, where he supported himself by translations, reviews, magazine articles, and the like. He here formed a friendship with Voltaire that had no little influence on his career. He went to Wittenberg for a time at the request of his father, who believed he would then come under more orthodox influences. But he was soon back in Berlin. From this time Lessing's life is spent chiefly in Leipsic, Berlin, Breslau, and Hamburg. We find him occupying various positions,—secretary to the governor of Breslau, critic and director of the theater at Hamburg, librarian to the Duke of Brunswick at Wolfenbüttel. He was usually struggling with poverty, although too sincere to accept lucrative positions which in any way hindered his independence. Hosmer says of him that he might have smoothed his path by a little fawning to those in power, but that "nature had left his knees unhinged." In his forty-eighth year, Lessing

married a woman in every way worthy. She died within a year. Much broken by this loss, Lessing lived for three years thereafter. He died in Brunswick at the age of fifty-two.

The writings of Lessing are numerous. Beginning with his university days, he continued to write until the last. His collected works, including magazine contributions and miscellaneous papers, were published in Berlin in 1828 in thirty-two volumes. Of these, four are of especial interest. These are *Laokoön* (1766), *Minna von Barnhelm* (1767), *Emilia Galotti* (1772), *Nathan der Weise* (1778). *Minna von Barnhelm* was called the first national drama of Germany, and is ranked by many critics as the greatest German comedy. It was written with a threefold purpose,—to free the stage from French influences, to call attention to the indifference shown by those in authority to the soldiers who had served faithfully in the Seven Years' War, and to bring about more peaceful relations between Prussia and Saxony than then existed. All these purposes were fulfilled to a marked degree. In addition *Minna von Barnhelm* is an admirable and pleasing literary production. The piece is pervaded with a delicate humor and its noble lessons are learned in that unconscious way which makes lessons most effective. The character of "Minna" is charming and natural.

Emilia Galotti is a tragedy, ranked by certain critics as the greatest of German tragedies. To the popular taste it is not equal to *Nathan der Weise,* which is Lessing's masterpiece. As a production for the stage, the latter is open to criticism, but it should be read as a dramatic poem. It might even be called a didactic poem, for it teaches religious tolerance as no other literary production has ever taught it. The Jew, the Christian, and the Mohammedan are brought together on common ground. A religious controversy in which Lessing had defended free inquiry had been discontinued by command of the Brunswick government. *Nathan der Weise* was the final answer of Lessing to his opponents.

Laokoön is a critical work of importance. The title is taken from the name of a celebrated piece of classical statuary representing Laocoön and his two sons in the coils of the serpents. The work of Lessing is a treatise on the fundamental differences between poetry and what he calls the "formative arts,"—painting and sculpture. The work was not completed, but is a great production.

Lethbridge, Alberta, an important trading and industrial center of the province is on the Old Man River, 133 miles south of Calgary and 101 miles west of Medicine Hat. It is served by the Canadian Pacific Railway. Lethbridge is situated in a very rich agricultural region, and is the distributing point for an extensive mining and lumbering district. There are numerous industrial plants, producing bricks, flour, macaroni, iron, steel and brass products, sashes and doors, brewery products, and other commodities. An extensive trade in hay, grain, wool, live stock and other farm produce is carried on. The city contains large stockyards and a Dominion Experimental Farm.

Lethbridge is in all respects a modern city, with well-paved and lighted streets, a water filtration plant and a sewage disposal plant. There are four primary schools, a high school, manual training school and a library. The most noteworthy buildings are the Dominion Land Office, the Y. M. C. A., court house, and the customs building. Lethbridge is the headquarters of the Alberta division of the Royal Canadian Mounted Police. In 1921 the population was 11,097.

Lethe, lē′thē, in Greek mythology, the river of oblivion. Those who drank its waters lost all knowledge of their former existence. Before passing into the Elysian fields souls drank here that they might forget all their earthly sorrows. See HADES.

Her wat'ry layrinth, whereof who drinks
Forthwith his former state and being forgets—
Forgets both joy and grief, pleasure and pain.
—Milton.

Leto, in Greek mythology, the mother by Zeus of Apollo and Artemis. She is called Latona by the Romans.

Letter of Credit, a commercial instrument used chiefly by travelers. It is usually a letter which one party writes to a second requesting him to pay a certain sum of money to a third. It differs from a

draft only in that the amount is not stated excepting as a maximum not to be exceeded. For instance, if a man were about to sail for London he might go to a bank or an express company, deposit a thousand dollars and receive a letter to the firm's London agents directing them to pay him not more than that amount on request. A small charge is made for issuing letters of credit, but a traveler finds them more convenient than the same amount in currency. Usually the firms issuing them are so well known that the letter is honored at any bank where it is presented. If drawn on several parties, it is called a "circular letter of credit."

Lettuce, lĕt'tĭs, a garden herb closely related to the dandelion. The name lettuce is without doubt related to a Latin noun meaning milk, and has reference to the milky juice of the plant. The native land of the lettuce is not known certainly, but lettuce salad is said to have been served at the tables of Persian kings as early as 400 B. C.

The valuable part of the plant is a rosette of root leaves much used as a salad. Lettuce requires cool weather. That grown in early spring is much more tender than summer lettuce. Much of the lettuce in market is grown in hotbeds and glass houses. Lettuce is a quick growing annual. Under favorable circumstances, it may be had ready for the market in sixty days from the seed. As in the case of cabbage, there are numerous varieties, some forming heads much earlier than others. The plant is an annual. The leaves are no sooner ready for the table than a seed stalk pushes up from the center of the rosette. About thirty plants produce a pound of seed. American gardeners depend almost entirely upon California for lettuce seed. The state produces a quarter of a million pounds annually. An ounce of seed should produce about 5,000 plants. See VEGETABLES.

Leutze, Emanuel (1816-1868), a German-American historical painter whose best known work, *Washington Crossing the Delaware,* is familiar to all Americans. He was born at Gemünd, Württemberg, but came to America while still young, settling in Philadelphia. Here he studied art. Attracting attention with one of his pictures, he secured a number of orders, making enough money to permit him to travel and study in Europe. Mr. Leutze then devoted himself to English, Spanish and American historical subjects, and the work mentioned is the finest he ever did. His coloring was frequently crude and his drawing academic, but he succeeded in individualizing his characters, nevertheless. Other important canvasses by Leutze are *Columbus Before the Queen, Landing of the Norsemen in America, Cromwell's Visit to Milton, Henry VIII and Anne Boleyn, The Court of Queen Elizabeth, News from Lexington, Washington at Monmouth, Washington at the Battle of Monongahela, Washington at Princeton, Lafayette in Prison Visited by His Relatives, Westward Ho,* a mural painting for the staircase of the Capitol at Washington, also portraits of Lincoln, Grant, General Burnside and Worthington Whittredge. Leutze is noted for his subjects rather than his art.

Levant, lē-vănt', a term applied originally by the Italians to countries lying to the eastward of them or toward the sunrise, and more specifically to Asia Minor and Syria. It is a convenient name by which to designate the coast region and the islands of the eastern Mediterranean. The Venetian sailor calls an east wind a levanter. Levant morocco is a superior kind of leather prepared originally in the Levant from the skin of the Angora goat.

Levee, lĕv'ē, in engineering, an artificial embankment built along the banks of a river to prevent its overflowing during high water. Various European rivers have levees. The greatest levees in the United States are those along the lower Mississippi, where they extend for hundreds of miles. They are fifteen feet high in places, and thirty feet broad at the base. The levee before New Orleans is very wide, and serves as a wharf for the mooring of vessels. The maintenance of levees is a great expense to the seven lower river states, though the original cost of building them has been shared of late years by the federal government.

Lever, lē'ver, **Charles James** (1806-1872), an Irish novelist. He was born at Dublin and died at Triest, where he held a consular position. He was educated for medicine at Trinity College, Dublin, and at Göttingen, Germany. He made a reputation during the epidemic of cholera in 1832, and later entered the consular service. He began writing serials for the *Dublin University Magazine.* The first chapter of *Harry Lorrequer* appeared in February, 1837. Its success was such that he used the title as a pen name. Other tales are *Charles O'Malley, Tom Burke of Ours,* and *Lord Kilgobbin.* As a whole, his novels are light and rollicking, and of no great permanent value.

Lever, a rigid bar free to move about a fixed point called the fulcrum. A crowbar is a typical lever. It is common to classify levers as: first-class, with fulcrum between the force and the resistance, as a pair of scissors; second-class, with resistance between the other two, as a nutcracker; and the third-class with force applied between the fulcrum and the resistance, as a sugar tongs. The law of the lever is a simple modification of the simple law of machines and is usually stated thus: The product of the force and the force arm is equal to the product of the resistance and the resistance arm. By arm is meant the distance from the force or resistance, to the fulcrum. Levers often greatly modified, are to be found in many more complicated machines.

Leverrier, Urbain Jean Joseph (1811-1877), a French astronomer, was born in Normandy. He was admitted to the Ecole Polytechnique in 1831, and early distinguished himself by several abstruse papers of scientific import. When the chair of astronomy at the Polytechnique was offered him, he accepted it. He applied himself to the study of the motions of the planets, and as a result of his laborious investigations and calculations, the attention of astronomers was directed to the point in the heavens, where a few days afterwards, the planet Neptune was actually discovered by Galle at Berlin. For this he received the Grand Cross of the Legion of Honor, and a professorship in astronomy in the Faculty of Sciences at Paris. In 1854 he became director of the Observatory at Paris, which position he held till his death.

Leviathan, an aquatic animal mentioned in the Old Testament, the Hebrew word probably denoting crocodile, but the term is also used to mean a sort of cloud snake which darkens the skies. It is frequently referred to in the Scriptures, and is variously held to be the crocodile, the whale, or some species of serpent. The theory has been put forth that the leviathan was originally a mythological monster. The dragon which plays so prominent a part in the Apocalyptic literature of the New Testament, and which also occurs in "Bel and the Dragon," a secondary canonical addition to the Book of Daniel, reverts to the conceptions concerning the leviathan.

Levis, Quebec, the county town of Levis County, is situated on the south bank of the St. Lawrence, opposite the city of Quebec, and on the Intercolonial, the Grand Trunk and the Quebec Central railroads. The city is interesting for its situation in the midst of great scenic beauty, and also is important industrially. It has a shipyard, and manufactories of wax tapers, leather, boots and shoes, knit goods and cigars and machine shop products. At Levis is the largest graving dock in the world, 1,150 feet long, capable of accommodating the largest ship afloat. The city contains good public schools, a classical college and a convent for girls. In 1921 the population was 10,470.

Levite, In Jewish history, a descendant of Levi, one of the sons of Jacob. The family of Aaron, one of their number, was set aside as priests. The rest of the tribe were assistants to the holy office. The Levites had no fields, but were assigned thirty-five cities as places of residence. They were supported by tithes, or a fixed share of the produce of the other tribes. They were excused from going to war. They guarded the tabernacle and carried it from place to place until it was established in the Temple of Solomon. They assisted at religious services, furnished music, and had charge of the church revenues and treasures. They prepared the corn, wine, and oil for sacrifice. They were the learn-

ed tribe of the Israelites, — the religious guides and teachers of the people, and they became scribes and judges.

Leviticus, the third book of the Old Testament. It prescribes laws regarding sacrifices, narrates the consecration of Aaron, the deaths of Nadab and Abihu, and makes regulations as to purification, marriage, festivals, worship, social arrangements, vows and tithes.

While the integrity of the work is admitted by most critics, there have been numerous controversies regarding the subject matter, as, for example, that the Levitical legislation did not take place until 1,000 years after Moses; that the book, or a portion of it, was written by Ezekiel; and that it probably was written by different writers.

The best commentary on the book of Leviticus is the Epistle to the Hebrews. Many students have held that the book was written earlier than the Exile. This point is yet undecided, but there is a general belief that parts of Leviticus belong to the period of the Kingdom of Judah.

Lewes, George Henry (1817-1878), an English philosophical writer, was born in London. Entering upon a commercial career early in life, he later began the study of medicine. Both these pursuits he finally abandoned for literature. In his twenty-first year Mr. Lewes went to Germany, remaining there two years and studying the life, language, literature and philosophy of that country. Upon returning to London he began to contribute articles to various periodicals. In 1845 he published his *Biographical History of Philosophy*, proving by this work his ability as a thinker and writer. During 1849-54 Mr. Lewes was editor of the *Leader*. While in this position he published a *Life of Robespierre*, a summary of Comte's *Philosophy of the Sciences* and an able *Life of Goethe*. Mr. Lewes' chief interest to modern men is his long and happy association with the famous novelist Marian Evans (George Eliot). Mr. Lewes had married in 1840, but the marriage had been very unhappy. Although legal difficulties prevented his securing a divorce, he and the novelist lived as man and wife until his death. Other works by Mr. Lewes are *Problems of Life and Mind* and *The Spanish Drama*.

Lewis, Meriwether (1774-1809), an American explorer. He was born near Charlottesville, Virginia, August 18, 1774, and died near Nashville, Tennessee, October 8, 1809. He was a private in the force of troops enlisted to suppress the whiskey rebellion in western Pennsylvania in 1794, and later entered the regular army. In 1801-3 he served as Jefferson's private secretary. Jointly with Captain William Clark, he commanded the famous Lewis and Clark Expedition to Oregon. On his return he received a grant of land in Louisiana and was appointed governor. He was a man of intelligence, enterprise, and patriotism. See CLARK; OREGON.

Lewis and Clark Expedition, in American history, an expedition dispatched by Thomas Jefferson to examine the resources of the far Northwest. When, in 1801, Jefferson took the oath of office as president, the Northwest was not well known. Alexander Mackenzie, factor for the Hudson Bay Company, had indeed traced the Fraser river to Puget Sound; some forty New England captains following in the wake of Captain Grey were making the long trip by way of Cape Horn to buy furs along the Pacific coast; and the agents of the Hudson Bay Company were bartering for furs at Mandan and other points on the Missouri; but, so far as known, no white man had seen a vast extent of country about the headwaters of the Missouri and the Columbia. It was supposed to belong to France or Spain or Great Britain, or to nobody; at least the American Republic had no title west of the Mississippi.

Jefferson and others had an eye on this region however. Several plans for exploration had miscarried. One of the first measures of the new administration was to provide for an adequate examination of a region believed to be rich in furs, timber and minerals. In the winter of 1802-3 Congress agreed to an appropriation of $2,500 for the purpose. Jefferson organized the party as a military expedition sent out by the War Department. Officially, it was a detachment of the regular army composed of officers and privates sworn in for a special service. The com-

mand was entrusted to Meriwether Lewis, Jefferson's private secretary, in whom he had confidence. Lewis was given a captain's commission. He asked that William Clark, an old comrade of his Virginian boyhood, a fellow soldier in the army of "Mad Anthony" Wayne, be given a captain's commission and an equal share in the conduct of the expedition. The authorities thought best to make Clark a lieutenant; but the two friends arranged the matter between themselves jointly. Clark was addressed as captain from start to finish, and is called captain to this day. The roll of the expedition carried, first and last, twenty-nine enlisted men and officers, counting Captains Lewis and Clark, French and half-breed interpreters. Clark's negro servant, York, and an Indian woman, in all forty-five persons. Of the men who took part in the expedition, only one, Chaboneau, a Frenchman, was married; he had three wives. Lewis bade the president goodbye July 5th; he embarked at Pittsburg August 31st and proceeded down the Ohio. He obtained volunteers at the garrisons and was joined by Captain Clark at Louisville. The company proceeded down the Ohio and up the Mississippi to River Dubois, a point in Illinois, in American territory, opposite the mouth of the Missouri. In the meantime Louisiana had been purchased, but it was deemed wise not to give offense to Spain, which still laid claim to the region, and might lodge a protest against invasion. During the winter Clark drilled and disciplined the soldiers, while Lewis made several trips to the French fur trading village of St. Louis and picked up pointers for the trip. March 9th and 10th Lewis was the chief official witness of two cessions of upper Louisiana, —one by the Spanish authorities to the French, and a second by the French to the United States; so that no possible interference could be expected on the east side of the Rockies. The secretary of war furnished supplies.

It is evident that the expedition took ample time to get ready. What with supplies furnished by the war department and purchases made out of the $2,500 there was no lack. There was an abundant supply of powder and lead, seven barrels of salt, fifty kegs of pork, any quantity of "hulled corn," a bag of "beens" and another of "pees;" there were two tons of flour and one-half ton of biscuit; there were 100 pounds of candles, a bag of candlewick and half a hundred weight of soap. No less than 700 pounds of lard or "grees" were taken along. As to coffee and sugar, fifty pounds of coffee and 112 pounds of sugar were all that were required, but several barrels of whiskey were taken along for the stomach's sake. In fact, on a later occasion, the sentinel who was guarding the supplies was convicted by court martial not merely of drawing whiskey from a barrel for his own needs, but of permitting a comrade to do the same. Both were properly whipped on the "bear back at parrade." Whatever else may have been wanting there was no lack of discipline. Twenty-one bales of goods were taken for trade with the Indians in a region where money was useless. The chief boat in which the party proposed ascending the Missouri was a keel boat fifty-five feet long, drawing three feet of water. It was furnished with a sail and twenty-two huge sweeps or oars. A covered deck ten feet in height formed a forecastle, and a similar deck at the stern formed a cabin. The middle was furnished with boards that might be set up in case of attack. Smaller boats were taken also.

The expedition left the Illinois shore May 14, 1804, and "proceeded on under a jentle brease up the Missouri." The entire summer was spent in ascending this river. A few miles below Sioux City, Sergeant Floyd sickened and died. An appropriate monument now marks his grave. This was the only death on the entire trip. The ascent was laborious. When the current was swift, the men formed in line with a towrope, and when the flatboat struck on sandbars, they got it off as best might be. The hunters scoured the shores for antelope, deer, buffalo, and wild fowl. Indian villages occupied the present sites of cities. Indian hunters brought in supplies for the veriest trinkets. With a single exception, it may be said once for all that, so far from encountering hostility, the Indians, as yet unspoiled by contact with white men, were kindly and hospitable.

Had the opposite been true the expedition could not have won through.

By laborious poling, pushing, towing, and sweeping, the party passed by the sites of Kansas City and Omaha and Sioux City and Yankton and Pierre and Bismarck, arriving November 2d at Mandan, a long, laborious 1,600 miles from St. Louis. Here they tied up for the season. Log houses were built and surrounded with a palisade, within which the party passed the winter. "Canoes made of a single Buffalow Skin" surprised Captain Clark, who, always entertaining, noted also the native dress, "Simply a pr mockerson, Leagin, flap in front and a Buffalow roabe, with their hair, arms, and ears Decorated." The white men saw a prairie fire, and had opportunity to join in buffalo, deer, antelope, wolf, and jackrabbit hunts.

In the spring the barge was sent back in charge of six soldiers. It carried copious notes of travel to date and four boxes and a trunk for President Jefferson, all closely packed with horns, skins, and skeletons, plants, native pottery, bows and arrows, an ear of Mandan corn, and articles of Indian dress. Among the animals thus represented were the antelope, blacktailed deer, coyotes, jackrabbit, prairie dog, big horn, red fox, and magpie. Three cages were sent containing a "burrowing squirrel," "4 liveing magpies." Clark's crow, and "a liveing hen of the Prairie." Jefferson sent many of the specimens to his home in Monticello, and some are still to be seen in Peale's Museum, Philadelphia. We may add that Captain Lewis continued to collect plants, seeds, and other specimens not too heavy to carry. The grizzly bear was brought to notice by him.

April 7, 1805, the party, now reduced in numbers and having less freight, set off with two boats and six canoes for the head of navigation on the Missouri. Bird-woman, who had been stolen from her home in the Bitter Root Mountains, and who was the wife of Chaboneau, the interpreter, sat in her husband's canoe. She was eager to see the home of her childhood, and the explorers thought well to take her and her papoose along. Passing by the mouth of the Yellowstone, where now stands Fort Buford, and portaging at Great Falls, the boats were pushed along to the headwaters of the Jefferson fork of the Missouri to where a man could "bestride the channel." Here the boats were hidden away. Lewis and two attendants found an Indian trail and followed it persistently till they came upon a Shoshone village. He had difficulty is persuading the Indians that he was not trying to lead them into an ambuscade; but finally a party set out with him to bring in the expedition. The chief proved to be the brother of long lost Bird-woman. The Shoshones were in poverty, living largely on berries, but they did their best. Lewis and Clark hid their boats, and cached a lot of articles they could not carry. They bartered gay coats and other goods to the Indians for horses, and set out with an old Shoshone as guide to make their way through the Bitter Root Mountains. The streams were too swift for boats, and trails were hard to find. The party was nearly starved, but won through the Bitter Root Valley.

Ere they reached the mouth of the Clearwater, where Lewiston now stands, they had navigable water again. Food was obtained by hunting and from the Indians. Canoes were made out of tree trunks. The horses were left with the friendly Indians to forage, and the party, Bird-woman still with them, were afloat once more. October 16th the party was at the mouth of the Snake. A week later they were at the Great Falls of the Columbia, October 30th at the Cascades, and in November the weary pioneers reached the shallow bars over which the wide Columbia rolls its waters to the Pacific.

President Jefferson had given Captain Lewis a letter of credit to be presented to the captains of such ships as might be on the coast. This letter requested supplies to be paid for by the government, but the season was late; no ships dropped in. December 7th the soldiers began to build a rude stockade some fifty feet square, which they named Fort Clatsop. Log houses were built inside this stockade, and here the party spent what was left of the second winter. While not starving, the party was in reduced circumstances. The natives had been "spoiled" by contact with the summer fur buyers and showed an "avaricious

spirit." The explorers exercised no small degree of ingenuity in the manufacture of trinkets with which to barter for food supplies. Elk, salmon, and berries were obtained. The cairn, or stone furnace, in which they fixed their kettles to boil down sea water to obtain salt is pointed out still.

March 23, 1806, the return began. A bag of precious salt was taken along. The horses were found all right. The Indians had been faithful and the ponies had wintered well in the river bottom on a kind of grass that dries into nutritious hay standing uncut. Here the boats, battered and worn by the rocks, were abandoned. The party was too impatient to rest long. A start was made too early. Snowstorms delayed the march in the mountains. Clark, guided by Bird-woman, returned by way of the Yellowstone, rejoining Lewis below what is now Fort Buford. At Mandan Mr. Colter obtained permission to leave the party for the life of a trapper. He returned to the mountains and is believed to be the first white man to set foot within Yellowstone National Park. Bird-woman, ever modest, efficient, and true, was left with her husband at Mandan. The rest of the party kept together under discipline and reached St. Louis, 4,000 miles from Fort Clatsop, September 23, 1806. The journey from the Mississippi river to the Pacific and back again, 8,000 miles, occupied two years four months and nine days. The same trip can be made now in a week. A mail carrier had just left St. Louis for the East. A messenger was sent to overtake him and hold him a day until letters could be prepared to put in the bag. There was no little rejoicing in Washington, for the expedition had been given up as lost.

President Jefferson had enjoined the duty of note taking. Lewis kept a journal and Clark kept a diary. The four sergeants wrote journals. One notebook by a private is in existence. Strangely enough, the records were never filed with the secretary of war, but were regarded as private property. There was delay in printing. We had no Smithsonian Institution in those days. It never occurred to Congress that the records of the trip were priceless. The leaders of the expedition were appointed to office and were kept busy with public duties. The journals were printed finally at private expense. Many versions appeared. It seems inconceivable, but a complete and properly collected edition of the various journals was not issued until that of Reuben Gold Thwaites appeared in 1904. This edition consists of seven rich volumes and an atlas, and is a treasure for any library.

Although the reports were not published promptly and in a creditable form, the description of forests, minerals, salmon, fur, and agricultural possibilities made a profound impression, and led to insistence on a Pacific frontage for the United States. The geographer has preserved the names of the leaders in both mountain and stream. The botanist has paid them a graceful tribute by naming a phlox-like flower of the evening primrose family Clarkia.

Lewis and Clark Centennial Exposition. In 1905 a celebration was held at Portland, Oregon, to commemorate the one hundredth anniversary of the exploration of the Oregon country. The site consisted of 385 acres of land and lake, at the base of the foothills of the Cascade Range. Ten large exhibits formed the nucleus of the exposition. The grand total attendance was 2,545,509.

Lewiston, a city of Idaho, located at the junction of the Snake and Clearwater Rivers, and the county seat of Nez Perces County. The Snake River is here spanned by a long steel suspension bridge. The city is noted as a mining center, and is also a distributing point for fruit, grain, live-stock, and lumber. As a fruit district the territory about Lewiston ranks among the greatest in the West. Its peaches and grapes are especially famous. Located there are a state normal school, St. Joseph's Hospital, a Carnegie library, and a business college. According to the 1920 census, the city numbers 6,043 people.

Lewiston, a manufacturing city of Maine, on the Androscoggin, opposite Auburn. Four large bridges connect the two cities. The falls of the river, fifty feet in height, furnish much water-power for manufacturing. The principal products include cottons and woolens, machinery for the manufacture of cotton and woolen goods,

boilers and engines, foundry products, leather belting, boots and shoes, lumber, furniture, carriages, and bricks. Bates Theological School and Bates College, the first college on the Atlantic coast to admit women, are located there. The city has a fine Carnegie library. In 1920 the population was 31,791.

Lexicon. See DICTIONARY.

Lexington, a city in the famous "blue-grass region" of Kentucky. It is a market for the commodities one usually associates with the "blue grass country"—thoroughbred horses, whiskey and tobacco. It is the seat of famous race tracks, and is noted for the beauty of its parks and environment. For many years Lexington was the home of Henry Clay. Manufacturing is the leading industry; among the products are Bourbon whiskey, harness, saddles, flour, lumber, canned goods, carriages, wagons, hemp, tobacco, and stoves. St. Catherine's Academy, three colleges for women, the state agricultural college, the Kentucky Reform School, and Kentucky University are important educational institutions There is a good public library, hospital, and an industrial home for colored children. The population in 1920 was 41,534.

Lexington, a town of Middlesex County, Massachusetts, about twelve miles northwest of Boston. It was settled in 1642. It was noted as the scene of the first bloodshed between the colonists and the British troops at the opening of the Revolutionary War. A force sent out by General Gage to capture and destroy military stores attacked the American militia on Lexington Common April 19, 1775. Men fell on both sides. The loss of the British during the retreat that followed was considerable. Lexington is still a prosperous agricultural town of about 4,000 people. The triangular village green is still open. The old Buckman Tavern has been converted into a dwelling house. The Clark parsonage, in which Hancock and Sam Adams slept the night before the battle, has been moved from its original site, but it still stands. The bones of those who fell on the green have been reinterred in a mahogany sarcophagus and placed in a stone vault. A quaint old monument now mantled in ivy bears a long inscription writen by the pastor, Jonas Clark. It is inscribed in hourglass fashion, giving the names of those who fell, and is punctuated by such sentences as, "The die was cast," "They nobly dared to be free." In Memorial Hall, as a part of the Town House is called, there is a collection of Revolutionary relics. There are statues of John Hancock and Adams. Tablets give the names of the Lexington men who fell in battle. A modern tablet gives the names of twenty Lexington men who fell in the Civil War. It bears the inscription, "The sons defended what the fathers won." There are several cases of relics. Major Pitcairn's pistols, captured during the retreat, are kept here, as well as quite a collection of old flint muskets. See REVERE; CONCORD.

Leyden, lī'den, a city in the Netherlands. It is situated on the Old Rhine, six miles from the North Sea, about twenty minutes by rail from the Hague on the way to Amsterdam. The surrounding country is below sea level and is protected by dikes. In 1573 the city was besieged by the Spaniards and was saved by William of Orange who cut the dikes and drove the Spanish army out by a flood. The neighborhood is a fine dairy region with picturesque canals, windmills, gardens, and meadows. The University of Leyden, founded in 1575, was long one of the most renowned in Europe. The Leyden jar was invented by one of the professors. There are still several hundred students. A botanic garden, an observatory, a library of 160,000 volumes, museums of natural history, art, and antiquities, are open to students and visitors. Leyden still has the quiet air of an academic city. Broad Street is one of the finest streets in Europe. The statehouse is an interesting building. The front is imposing. Thirty windows are arranged in a straight line. In the time of the Elzevirs Leyden was the chief seat of the European book trade. It was the birthplace of Rembrandt and other celebrated painters. The Pilgrim fathers resided here in 1608-20, ere their departure for Plymouth. The early reputation of the city as a center of cloth manufacture has of late been revived. The Old Hall of the cloth merchants was one of the most beautiful build-

ings of the kind in Europe. The population is reported at 65,635.

Leyden Jar, a well known piece of electrical apparatus. It was invented in 1746 by Cuneus, a professor in the University of Leyden, Holland. The jar is simply a condenser. It consists essentially of a jar coated within and without with tin foil for about two-thirds of the height. A brass rod passes inside, through a stopper, a chain connects the inner end of the rod with the inner coating. The outer end of the rod terminates in a knob. The jar may be charged by bringing one of the coatings into connection with the conductor of an electrical machine and connecting the other coating with the ground. The coats will become charged with opposite kinds of electricity which attract each other but are kept apart by the glass wall of the jar. If the knob be connected with the outer coating the charges leap together. If the outer coating be touched with one hand and the knob with the other, the charge will pass through the body, imparting a shock, which, in the case of a large jar powerfully charged, is sufficient to cause death. The ordinary strokes of lightning are discharges of a similar nature. The earth and a cloud are the coatings; the air which separates takes the place of the glass of the jar. The bolt of lightning is the discharge.

Lias, lī'as, in geology, a rock formation. It consists chiefly of grayish limestone, shales, and marlstones. It is characterized by a wealth of fossil remains, especially ammonites and other shells. The lizard-like animals known as the ichthyosaurus (ik-thĭ-ō-sau'-rŭs) and the pleiosaurus (plī-ō-sau'rŭs) are found in this formation. The lias is particularly well developed in England. It is found on adjacent parts of the continent. In the United States a similar formation occurs in Oregon and California. Lias quarries have a peculiarly striped appearance, owing to the occurrence of layers of differently colored rocks.

Libby Prison, a Confederate prison at Richmond, Virginia, in which Union soldiers were confined. It was originally a tobacco warehouse situated on an island in the James River. The Union soldiers tell many a tale of cruelty and privation. The Confederate authorities maintain that their own men in the ranks were too poorly fed and clothed to justify more liberal provisions for prisoners. At the time of the World's Fair the old prison was torn down and carried to Chicago, where it was set up as a war museum. See RICHMOND.

Libel. See SLANDER.

Liberals, in British politics, a new party name for the Whigs. Since the assumption of the name the Liberals have been "in" about three-fourths of the time. The Conservatives have been in power just enough to keep the Liberals up to their best work. The ministries of Grey, Melbourne, Russell, Aberdeen, Palmerston, Gladstone, Rosebery, Chamberlain, Campbell-Bannerman, H. H. Asquith and David Lloyd-George were Liberal. Gladstone was the greatest. Among the important measures carried by the Liberals are the extension of the franchise; the emancipation of West Indian slaves; wholesome factory laws; the abolition of the pillory and the whipping post; the establishment of public schools; the adoption of free trade; a more just treatment of Ireland and other measures. From 1896 to 1911 the Liberal party controlled the government of Canada. They were again returned to power in 1921.

Liberator, The, in South American politics, a name given to Simon Bolivar. He took a prominent part in delivering Venezuela, Ecuador, and Peru "from the Spanish yoke." See BOLIVAR.

Liberator, The, an anti-slavery paper. It was published at Boston, 1831-1865. It was founded, edited, and published by William Lloyd Garrison. His editorial utterances gave bitter offense to Southern readers. The mayor of Boston was urged repeatedly to suppress the sheet.

Liberia, lī-bē'rĭ-a, a negro colony on the west coast of Africa. It was established in 1822 by the various British and American societies for the abolition of slavery. It was the original plan to return slaves to Africa as rapidly as their freedom could be secured. Many difficulties were encountered and privations endured. By 1832 there were 2,500 negro settlers. In 1847 an independent state was organized on the model of the United States. Voters were required to be of negro blood and to be

property holders. The natives of the country were permitted to become citizens. Monrovia, named for President Monroe, was made the capital. The following extract is taken from the so-called Liberian declaration of independence of 1847:

In coming to the shores of Africa we indulged the pleasing hope that we should be permitted to exercise and improve those faculties which impart to man his dignity—to nourish in our hearts the flame of honorable ambition, to cherish and indulge those aspirations which a beneficent Creator hath implanted in every human heart, and to evince to all who despise, ridicule, and oppress our own race that we possess with them a common nature, are with them susceptible of equal refinement, and capable of equal advancement in all that adorns and dignifies man. . . . Among the strongest motives to leave our native land . . . . was the desire for a retreat where free from the agitations of fear and molestation we could in composure and security approach in worship the God of our fathers. Thus far our highest hopes have been realized.

Liberia has about 350 miles of coast. Area, 40,000 square miles. There are about 62,000 American negroes and their descendants. They live in a strip within six miles of the coast. It is estimated that there are 1,500,000 uncivilized native negroes in Liberia. The various Protestant religious denominations maintain churches and missions. There are 100 elementary schools having 3,000 pupils and an attempt is made to maintain a college. Import duties produce an annual revenue of $387,000, but the state is in debt nearly $2,131,700, counting principal and interest.

Trade is carried on chiefly with England, Germany, and the United States. Palm oil, palm kernels, coffee, rubber, and a fiber much used in making coarse brushes and street brooms, are the chief exports. Accounts are kept in American money. The country has abundant coal and other mineral wealth. Cocoa and cotton are raised readily. Coffee grows wild. There are magnificent unworked forests. The inhabitants should become independently wealthy, but the fact is that, despite the utmost efforts of their friends, the settlers have not done as well as was hoped for.

During the active period of African land grabbing, Liberia narrowly escaped appropriation. Territory not "effectively administered" was cut off by the French and by the British. There is a bitter feeling in Liberia against the British. An "Improvement Company" borrowed large sums of money in the name of the Liberian government and took possession of the custom houses to pay the interest. British officers organized and commanded the Liberian militia. A gunboat was sent to protect British interests. In 1908 the British consul general sent the Liberian government a notice to the effect that Liberia "must not lose a moment in setting herself seriously to work to put her house in order, *or be prepared, at no distant date, to disappear from the catalogue of independent countries.*" "If, however, the Government do not reform, no amount of guarantees will save them from the end which must surely, in the near future, await them." Under British influence, the Liberian militia rose in mutiny. Liberian independence seemed lost. In very desperation the Liberian government ordered British officers out of camp, and succeeded in inducing the American government to send a commission to decide whether the negroes of Liberia were incapable of self government. Since then affairs have seemed to mend.

The following excerpts are condensed from a sympathetic article by Edgar Allen Forbes in *The World's Work* after a journey through the country:

The people of Monrovia look, dress, and act very like the better-class negroes of Atlanta or Louisville. All the Americo-Liberians (and many civilized natives) are neatly but not flashily clothed, and most of the aborigines put on an extra cloth when they come to town. I doubt if there be anywhere in the United States a negro community of the size of Monrovia where there is so little boisterousness, profanity, or indecency. Swearing is a lost art, and I saw but one case of drunkenness during my first month in Monrovia. The Sundays suggests the quiet of a New England city—a quiet that is broken only by the sound of church organs and congregational singing. The churches are well attended, and the services are conducted with due regard to dignity and reverence. There appears to be a complete absence of the American saloon and of the degrading concert-hall.

In most respects, this description of Monrovia applies also to Harper, the original capital of the Maryland colony, which is more thoroughly American than any other part of Liberia. For tropical beauty and whole-souled hospitality, Cape Palmas is not surpassed on the west coast of Africa—so far as one man's experience goes. Between these two cities are several important ports of entry, and all along the coast are scattered little

settlements of Liberian planters—some prosperous and well-housed, others reflecting the deep poverty of sloth and failure. Bordering upon this coast-belt of civilization is a fringe of half-civilized natives, with a few fruit trees and some coffee-bushes around their squalid villages; and beyond these lies the great mass of the uncivilized, who plant nothing but what they eat and whose civilized attainments rarely extend further than tobacco, gin, calico, and gunpowder.

The Liberian people are American to the core. Before reaching the country, I had been led to believe that the present generation had forgotten the rock from which they were hewn, but one hour's sojourn in Monrovia convinced me that such was not the case. News travels fast in these "new and naked lands," and as soon as it was noised abroad that an American visitor had dropped in, all sorts and conditions of men began to call at the American legation. To the visitor it was almost like a homecoming. Men and boys passing along the street tipped their hats in greeting and even the children appeared anxious to welcome a man from the country about which they had heard all their lives. It happened during this first week that a delegation of farmers from up the St. Paul River came to the capital to make a political demonstration. Led by a small brass band, they marched to the executive mansion, and greeted the president; then they made a bee-line for the American legation to pay their respects to the Minister. Many of these men of the soil had served their apprenticeship in the cottonfields of the South, and their welcome to me was almost an ovation. One patriarch slowly climbed the steps as the delegation was leaving, and gave me his trembling hand. "I seed you on the porch," he said, "and I know'd you wuz some o' mine—and I'm some o' your'n." When I visited the various settlements back from Monrovia, I found a universal and unmistakable affection for everything that bears the American name.

Once freed from its present entanglements, no friend of the negro need be apprehensive about Liberia's future. The republic is rich in its soil and in undeveloped resources; it has a strong national spirit and a peace-loving population; and it has men endowed with the qualities of leadership —plenty of men.

If there be found occasion for censure in the present state of affairs, the United States must first plead guilty to criminal negligence. It was wholly unnecessary for Liberia to stand absolutely alone; duty to the memories of the Americans who founded the republic should have moved us long ago to inquire whether we might be of assistance. On a low, level site halfway down the street that leads from the hilltop of Monrovia to the surf that thunders beyond it is the old cemetery where the first Liberian settlers lie in their unwaking sleep, their graves almost concealed by the profusion of ferns that cover nearly every square yard from the street back to the impenetrable green of the African bush. To an American wandering through the bracken, it becomes transformed into a map of the Southern States. "A Native of the U. S. A."; "Of Charleston, South Carolina."; "A Native of Georgia"—almost every discolored slab bears some such inscription.

Near the farther side of the cemetery, modest and unobtrusive even in death, I found the white men and women who went to their graves for Liberia. There are thirty mounds in one place, and no American can look down that long row without feeling that the place whereon he stands is holy ground.

Liberty Bell, the call bell of colonial Philadelphia. In 1751 the assembly (city council) of Philadelphia ordered a bell cast in London with instructions that it should weigh about 2,000 pounds and bear the inscription, "Proclaim Liberty Throughout All the Land, Unto All the Inhabitants Thereof." In 1752 the bell was hung in the belfry of Independence Hall. It soon met with an accident and was recast by a local firm. A year later it was necessary to recast the bell once more. From that time, it was used to toll all important events, including the battle of Lexington in April, 1775. At high noon, July 4, 1776, the bell was rung for the Proclamation of Independence, and in April, 1783, it rang the proclamation of peace with Great Britain. In July, 1835, while tolling for the death of John Marshall, whose body was passing to Virginia for burial, the old bell cracked and has been silent since. During the Revolutionary War the bell was removed in 1777 to Allentown to prevent its falling into the hands of the British, but it was brought back when the British evacuated Philadelphia. The Liberty Bell has been in great demand for exhibitions. It was, of course, a guest of honor at the Centennial Exposition held in Philadelphia in 1876. The bell has made seven exhibition trips as follows: In 1885 to New Orleans; in 1893 to Chicago; in 1895 to Atlanta; in 1902 to Charleston, South Carolina; in 1903 to Boston, to represent Philadelphia at the anniversary of the battle of Bunker Hill, a celebration at which the presence of this relic was most appropriate; in 1904 to the Louisiana Purchase Exposition held at St. Louis; and in 1908 to the Alaska-Yukon-Pacific Exposition at Seattle; 1915, the Panama Pacific International Exposition, San Francisco. It is customary to give school children an opportunity to see the bell in the larger towns through which it passes.

Liberty, Statue of, a colossal statue on Bedloe's Island in the harbor of New York. It was designed by Bartholdi, and was presented by the people of France to the United States in 1881. The pedestal is of stone. It was built by New York subscriptions. It cost with the mounting of the figure $350,000. The statue is of bronze, bolted to an iron skeleton or framework, and cost $250,000, making the entire cost $600,000. The bronze alone weighs 100 tons. The work was completed in 1886. The pedestal is a square structure. The top is 149 feet above the water level. The statue proper, from heel to tip of torch, is 151 feet high, the tallest known. The total structure rises 301 feet above the water level. Some idea of the size of the figure may be had from the dimensions of some of the parts. The index finger is eight feet long. The finger nail is ten by thirteen inches. The waist is thirty-five feet in diameter. The eyes are thirty inches apart. The head measures ten feet from ear to ear. The interior of the head is reached by an inner stairway and accommodates a party of forty. The torch is large enough to hold eight persons. The lighthouse service of the government maintains a light in the torch so that the statue serves as a lighthouse. See BARTHOLDI.

Liberty Loan. See U. S. STATISTICS.

Libraries, collections of printed or written literature. The earliest writings of which we have any knowledge were either religious or political. Temples sheltered the first libraries, and priests were the first librarians. Next in importance are state papers, collections of which are known as archives. In 1850 Layard, the celebrated antiquarian, came upon some chambers in the royal palace at Nineveh, the floors of which were littered with tablets of clay, covered with cuneiform inscriptions, some of them so minute that a magnifying glass was required to read them. Investigation showed that they had fallen evidently from shelves of an upper story, and that Layard had come upon the royal library. There is evidence that this library, if we may so call it, was catalogued and methodically arranged, and that it was open to the learned public for consultation. There appear to have been about 10,000 distinct works. Large numbers of the tablets, most of them in fragments, have been removed to the British Museum. At the present rate of progress a century will be required to read them all.

The literature of ancient Egypt was written in hieroglyphics on papyrus. Lepsius, an authority on Egyptian subjects, estimates that writings of this sort amounted to 36,525 books. Rameses I, whose library was arranged in a palace temple near Thebes, called his collection "the dispensary of the soul." Unfortunately the Egyptian collections have fared little better than those of the Assyrians.

Of Greek libraries little can be said. Their public buildings were built of short blocks of marble. They have not stood well. Plato is known to have had a library. Aristotle bequeathed a collection of volumes to one of his disciples. The libraries of Greece were carried away very generally by conquerors and little is known of them.

The most celebrated libraries of antiquity were those of Alexandria, Egypt. They were parchment and papyrus manuscripts, written chiefly in the Greek character. They were collected by Greek scholars during the reign of the Ptolemies, Greek rulers of Egypt. They formed practically a university library. According to the statements of their librarians, one of them contained 42,800 volumes or rolls, the other 490,000. The larger collection caught fire accidentally and was burned when Caesar set fire to the Egyptian fleet in the harbor of Alexandria. The fate of the other is not well established. According to one account, it was still in fair condition when the Arabs took the city in 640 A. D. The story runs that the Saracen commander ordered that it be destroyed on the score that if the writings agreed with the Koran, they were superfluous, and that if they did not agree, they should be burned. According to this story, the rolls were used to heat the baths of the city. This account is not considered credible, however. It is probable that there were very few books, if any, left at this date.

The early Romans were not noted for literature or libraries. Their first collections were Greek manuscripts brought

home as the spoils of war from the east. Toward the close of the republic we read of libraries formed by wealthy men. They were placed in charge of learned Greek slaves. The literary men of Rome were wont to sneer at the illiteracy of wealthy owners on whom they were dependent for library privileges. One of these collections is said to have contained 30,000 volumes; another twice that number. A library of 1,756 manuscripts was found in a richly furnished room in the excavations at Herculaneum. They were well arranged on shelves. Under the empire no less than twenty-eight public libraries were established in Rome. Constantine and his successors built up a library of 100,000 volumes at Constantinople.

After the downfall of the Roman Empire the monks were almost alone in cherishing learning. As early as the sixth and seventh centuries there were considerable collections in the monasteries of Ireland and at Canterbury, York, Whitby, Durham, and elsewhere. The library of the Venerable Bede at Jarrow was resorted to by young priests. Alcuin at Tours was noted as a librarian. Among rulers of the Middle Ages, Charlemagne and Alfred were noted, not only as collectors of volumes for their own libraries, but as affording encouragement to the monastic librarians. A list of libraries would simply be a list of the monasteries of the period.

As soon as the Arabians had extended the religion of Mahomet and secured their conquests they became patrons of learning. They built up large libraries at Bagdad in the East and at Cordova in Spain. Cairo and Tripoli had large collections. There are said to have been no less than seventy Arabic libraries in Spain. During the fifteenth century a revival of learning took place. Wealthy merchants and princes began again to vie with each other in the collection of books. Charles V and the Medici family deserve mention in this connection. Matthius, king of Hungary, is said to have amassed 50,000 beautifully bound manuscripts which fell into the hands of the Turks on the fall of Buda in 1527. A few of them are still preserved in the libraries of Europe.

Of English libraries that of the British Museum easily takes the lead. It contains not less than 1,900,000 printed books and 100,000 manuscripts and charters. The Bodleian Library at Oxford is credited with 570,000 volumes and 30,000 manuscripts. Cambridge University has 500,000 books and about 6,500 manuscripts. The Law Library at Edinburgh has 350,000 books. The Scottish universities have over 100,000 volumes each. Trinity College, Dublin, has 240,000 books. The large cities of Great Britain have public libraries ranging from 100,000 volumes upward.

The largest library on the continent, in fact, the largest in the world, is the national library at Paris of about 2,600,000 printed books and 103,000 manuscripts. The Royal Library at Munich has 1,000,000 books and 40,000 manuscripts. It may be said in passing that in Europe a royal or imperial library means the same as a national or public library in a republic. Other libraries are those at Berlin, 1,000,000 books, 30,000 manuscripts; St. Petersburg, 1,100,000 volumes, 28,000 manuscripts; Strasburg University, 760,000 volumes; the imperial library and the university at Vienna, 500,000 each; Göttingen, half a million; Leipsic University, 500,000; Copenhagen, 500,000; Stockholm, 280,000; Upsala, 300,000; Madrid, 500,000; Brussels, 375,000; Stuttgart, 432,000; Vatican Library at Rome, 200,000; Bologna, 255,000; Florence, 450,000; Genoa, 120,000; Milan, 170,000; Parma, 200,000; Naples, 357,000; St. Mark's at Venice, 403,000. There are also other libraries at Rome aggregating 1,000,000 volumes.

The earliest library in the United States was that of Harvard College, founded in 1638. The libraries of Yale and of William and Mary were founded in 1700. Franklin took a hand in founding the Philadelphia library in 1731; Charleston, South Carolina, established a library in 1748. The Boston Athenaeum dates from 1804. The earliest free public circulating library in the world is said to have been established by vote at Peterborough, New Hampshire, in 1833. Large libraries are now the rule in the cities of the United States. The various institutions of learning are building up libraries as rapidly as funds permit. The largest collection of American books is that

of the Congressional Library at Washington. In order to obtain copyright, authors are required to deposit duplicates here. According to the Librarian's report, there were on hand at the beginning of 1910, 1,702,684 books, 410,352 pieces of music, 183,724 prints, and 82,744 maps and charts.

Since the first organization of librarians in this country, in 1876, great progress has been made in the growth and management of libraries, and librarianship has become a well-defined calling. The American Library Association, a national body organized in 1876 with 103 members, now has a membership of more than two thousand. The *Library Journal,* which was also begun in 1876, was the first library periodical printed in the United States. This was the official organ of the A. L. A. till 1907, when its own *Bulletin* was established.

The chief features of the progress that marks these thirty-five years are: the perfection of technical aids that has made possible the easy and quick use of large masses of volumes; the technical training made possible by the development of library schools; the evolution of the traveling library system; work with children; cooperation with schools; development of branch libraries, and the beginnings of cooperative work in the preparation and printing of aids that may be accessible to all libraries at small cost. Of technical aids the one that has been most useful and most widely adopted is the *Decimal Classification* devised by Dr. Melvil Dewey, of which the first edition was printed in 1876 and the seventh in 1911.

The first library school was also conceived and established by Dr. Dewey, in the library of Columbia University in 1887; in 1889 it was removed to Albany, and is now a part of the New York State Library. There are eight other regular schools and two training classes, as follows: Pratt Institute School of Library Science, Brooklyn; Drexel Institute Library School, Philadelphia; University of Illinois Library School, Champaign; Simmons College Library School, Boston; Western Reserve University Library School, Cleveland; University of Wisconsin School of Library Science, Madison; Syracuse University Library School, Syracuse; New York Public Library School, New York City; Training School for Children's Librarians, of the Carnegie Library at Pittsburgh; Atlanta Training Class, at Atlanta, Georgia. These schools have become very important features in library management, students obtaining in them a practical knowledge of library methods that makes them valuable as assistants in large libraries or heads of smaller ones.

The system of traveling libraries, first practically worked out in the New York State Library in 1893, is now in wide use throughout the country under various managements so that state library commissions, county libraries, and large city libraries, distribute books to groups of people that do not have access to a city or village library. That the children are a very important part of the library's patrons is a conviction that has taken root in comparatively recent years; but it has been adopted so thoroughly that there are now few libraries, except very small ones, that do not have a separate children's collection in a room suitable to their needs. Of still later origin is the work with schools, which is finding expression in close coöperation with principals and teachers and selected classroom libraries for use during the school year. The establishment of branch libraries has received a great impetus in the last few years. Through their agency large libraries are solving what was hitherto a difficult problem, reaching the people that live at too great a distance from the main building to be able to use it to advantage. It is perhaps the most significant of all recent developments and one from which much may be expected in the future.

One of the many ways in which the spirit of coöperation that has always distinguished the American libraries has found expression is in the preparation of printed aids. The most important of these is the *A. L. A. Catalog,* compiled under the editorship of Dr. Melvil Dewey, with the coöperation of many librarians and experts. This catalog contains a selection of books in all subjects, best suited for the public library, with notes and with the necessary information for cataloging them, and has not only admirably served its purpose as a guide in the purchase of books by small

libraries but as an aid to individual readers. The second edition, 1904, has listed 8,000 volumes. It has been supplemented by a monthly list entitled the *A. L. A. Booklist.* Several other publications especially useful to small libraries are made possible through the income from $100,000 which Mr. Carnegie gave for this purpose. A second piece of coöperative work is the printing of catalog cards. This is done by the Library of Congress for current books and also for a considerable number of books of earlier date. Libraries can receive these cards at cost.

See ALEXANDRIAN LIBRARY; BRITISH MUSEUM; BOOK; PAPYRUS; LIBRARY OF CONGRESS; COPYRIGHT, ETC.

Library of Congress, a national reference library at Washington, D. C. The Library was authorized and established by act of Congress in 1800, the original purpose being to provide Government officials with necessary reference material. It was housed in the Capitol, of course long before the present wings were added to that building. It was destroyed when the British burned the Capitol and the guides are still careful to point out traces of that historic fire. That was in 1814. After the war the collecting of books was begun again, a valuable addition being made through the purchase of the 6,760 volumes of Jefferson's personal library, for which Congress paid $23,950. In 1851 the Library was reduced to 20,000 volumes by fire but since that time it has had a steady growth. According to acts of Congress approved April 15, 1886, October 2, 1888, and March 3, 1889, a tract just east of the Capitol was purchased and the present library building erected. The land cost $585,000 and the building, which was opened to the public in November, 1897, cost $6,347,000. The foundation covers a little more than three and three-quarters acres. The structure itself is of the Italian Renaissance architecture. It is 470 feet long and 340 feet wide and provides 583,755 square feet (13.4 acres) of floor space, not including four courts and a large central rotunda. It is easily the largest and finest library building in the world. In 1925 an auditorium, the gift of Mrs. Frederic Shurtleff Coolidge of New York City, was erected at a cost of $90,000 in the court yard adjacent to the Division of Music. While the auditorium will serve various secondary purposes, it is intended primarily for the promotion of chamber music and for that purpose Mrs. Coolidge provided an additional endowment of $500,000. These bequests followed soon after an act of Congress March 3, 1925, creating the Library of Congress Trust Fund Board, authorized to accept, receive, hold and administer such gifts or bequests of personal property for the benefit of, or in connection with, the Library, its collections or services, as may be approved by that board and by the Joint Committee on the Library. The Board consists of the Secretary of the Treasury, the Chairman of the Joint Committee on the Library, the Librarian of Congress and two members appointed by the President.

The main building contains decorations by about forty painters and sculptors, all Americans.

The Library is recognized as one of the "independent establishments" of the government, all of which are, however, responsible to the Chief Executive. Among these establishments are the Government Printing Office, the Smithsonian Institution, the Interstate Commerce Commission, the Federal Board for Vocational Education, the Federal Trade Commission, et cetera. In the more than 125 years of its existence it has had seven libriarians.

The salary of the Librarian is $7,500.

The Library itself is exceeded in size only by the Library of the British Museum, founded in 1753, and by the National Library of France, founded about 1460, or shortly after the invention of printing. It contains over 3,420,000 printed books and pamphlets. It has the world's largest collection of music, well over a million scores, and the world's largest collection of scientific reports and transactions. It has over a half million prints and photographs and a quarter of a million maps and charts.

Among the special book collections are: the Yudin, of Russian literature, 80,000 volumes; the Schiff, of matters Jewish, 20,000 volumes; the Weber, of Indian lore;

the Huitfeld-Kaas collection of Scandinavian history and literature; the John Boyd Thacher collection of works of art and industry of early periods and of books printed before 1500; and nearly 50,000 volumes dealing with China and Japan. Other important collections are represented by the Peter Force group of 22,529 volumes and 37,000 pamphlets, purchased in 1867 at a cost of $100,000, the Count de Rochambeau manuscript collection, purchased in 1883 for $20,000, the Toner collection of 24,484 volumes and pamphlets, a gift in 1882, and the Hubbard collection of engravings. In March, 1927, Mrs. John Boyd Thatcher's will made possible the addition of four groups of books of great value. One of them, of 1,930 volumes, was printed before 1801 and much of it represents the earliest specimens of printing. The second group, of 800 books, relates to Columbus and other early discoverers and contains a vast amount of valuable cartographical data, as well as thirty-four editions of Ptolemy's works. The third group, of 1,600 volumes, deals with the period of the French Revolution, and the fourth is a collection of autographs of the foremost people of that period.

Among the noteworthy accessions is a set of the great Chinese Encyclopedia, a copy of which is owned by the British Museum and regarded as one of its most valuable possessions. The Washington set was presented by the Chinese government—possibly as a slight acknowledgment of American courtesy and fair play in returning the undistributed balance of the Boxer indemnity. The American collection is particularly rich in history, political science, in official documents, and in books and pamphlets relating to local and state history. Among the valuable manuscripts lately transferred to our national library from various departments of the government are all the applications for public office received during Washington's administration, the original accounts and vouchers of his expenses in the Revolutionary War, and documents concerning pension claims of soldiers in that war. A file of newspapers is preserved.

The Division of Prints includes certain collections given or loaned, besides a large mass of material received by copyright and some by purchase. The manuscript collections are especially noteworthy for material on American history, some of the most distinguished of which has been received by transfer from the executive departments, the library being now regarded as the main custodian of the historical archive material in the possession of the Government. It has the papers of about seventeen Presidents and of various American statesmen.

The Library is the custodian of the originals of the Declaration of Independence and of the Constitution of the United States.

There are several avenues of accession. Congress makes regular appropriations for that purpose and in this way much material is added that could not be procured otherwise. The appropriation for 1926-27 was $1,398,996. Usually about $1,000,000 is devoted to service and contingent expenses, about $100,000 to the purchase of books and $120,000 to the up-keep of the building and grounds. According to the copyright law each book, pamphlet, piece of music, map, drawing, or other matter to be copyrighted can only be copyrighted after two copies (in some cases one copy) in the best binding are deposited with the Library of Congress. Even the matter copyrighted by citizens of the United States would keep a large corps of clerks busy accessioning it. But vast quantities of material are copyrighted in the United States by citizens of other countries. A corps of copyists is usually busy duplicating maps, charts, pamphlets, photographs and other materials loaned for the purpose by foreign governments which would not be otherwise accessible. A third source of growth depends upon the interest of public spirited people. An additional source of growth for the Library had its beginning in 1866 when the Library of the famous Smithsonian Institution was deposited with the Library of Congress. This addition of 40,000 volumes has been greatly augmented since then. Many foreign governments regularly exchange books and documents with the United States and in this way material is

added to the Library which it would be impossible to secure otherwise. By virtue of its many resources the Library has a vast and rapidly developing scope and diversity of material.

The Library is primarily the Congressional Library but is open to the general public for reading and study. All of the resources of the Library are at the disposal of the student. It is not a lending library except for the President, Vice President, senators, representatives, congressional delegates and commissioners, Supreme Court Judges, heads of departments, and a few others. These persons may borrow, but may not authorize others to do so.

Although not a lending library, an interlibrary loan system is maintained whereby a special service is rendered to scholarship by the loan to other libraries of books for the use of investigators engaged in serious research.

The general public is always welcome to write the Librarian of Congress for book lists or other similar data on any subject. The service is always prompt and reliable.

The Copyright Office is a distinct division of the Library of Congress and is located on the ground floor on the south side of the building and is open to the general public between the hours of nine and four-thirty. During the year ending June 30, 1926, 177,635 copyright registrations were made.

License, in law, the authorization of an act which would be illegal without such authorization. Acts thus licensed are often innocent in themselves, but are forbidden by law for the sake of protecting the rights of others. For instance, it is innocent enough to own a dog, but if a man should choose to keep twenty or thirty dogs his neighbors might reasonably object. So the law, in thickly settled communities, limits the number of dogs by exacting a small license fee from the owner. A license fee is often charged for the keeping of an automobile, or a carriage and horses. Such things are luxuries and considered a legitimate source of revenue. In many places a peddler or a pawnbroker must pay a license in order to engage in such occupation. This may be regarded as in the interest of what many consider more legitimate trades. A man who pays rent for a building in which to establish a business thinks a peddler should pay something for the privilege of carrying similar goods through the streets and selling them.

As a general thing law forbids the sale of intoxicating liquors at wholesale or retail without a license, although the terms on which such license is granted vary greatly. The question of liquor has occasioned much discussion among those advocating temperance or total abstinence. Some believe that no license should be granted to sell liquor except for medical purposes; others claim that limiting the sale of liquor by a high license, together with a proper supervision of the methods of such selling, will prevent persons from obtaining liquor in illegal ways, and in the long run further the cause of temperance more than could be done if no licenses were issued.

Lichen, lī′kĕn, a vegetable growth occurring on rocks, trees, and soils. Lichens are ordinarily of a dry, leathery texture, although some are gelatinous. They are gray, brown, greenish, yellow, blue, and even black. They have the form of crusts, patches, and cups. Sometimes they have a branching or even a moss-like growth. There are over 4,000 species. Many kinds grow best in an exceedingly dry situation; others like moisture. Most kinds prefer sunlight; others require shade. Nearly all lichens are able to endure long continued drouth without losing their vitality. They are surpassed only by bacteria in their ability to withstand the severity of Arctic winters. Lichens are found in all parts of the world. The Iceland moss, used for the table, and the reindeer moss, on which the herds of Lapland feed, are lichens. A lichen of Arabia is collected for food. When dry it is blown about by the winds and scattered in small grains or masses. It is just possible that the manna of the Wilderness, eaten by the Israelites, consisted of this lichen. The blue dye known as litmus is obtained from a lichen. One of the curious facts about lichens, and one that until lately escaped the attention of botanists, is that they are parasitic on lower forms of life known as algae. Strange as it may seem,

the little green spot on the surface of a stone feeds on a still less conspicuous plant which it conceals and shelters. The surface of rock is dissolved or eaten by the chemical action of acids found in both lichens and algae, thus forwarding disintegration and the formation of soil. An attentive observer has stated that the rocks and tree trunks of New England are painted with lichens; while those of Old England are clothed with moss.

Lichfield, a city of Staffordshire, England, sixteen miles north from Birmingham. The name means field of the dead. The introduction of a *t* in the American Litchfield deprives the name of character. Lichfield possesses an English cathedral, a guild hall, a market hall, a corn exchange, a public library and museum. The population is about 8,000. The town is of interest to the traveler chiefly as the birthplace of Dr. Samuel Johnson. A statue in his honor stands in the marketplace facing the house where he was born. Garrick and Addison were educated in the old Lichfield grammar school.

Lichgate, or **Lychgate,** a churchyard gate. The syllable *lich* is an old Saxon word meaning like. A lich is then a likeness or corpse of a person, and a lichgate is the gate through which the likeness or corpse is borne to its burial. As generally understood, the lichgate affords some sort of shelter varying from a rude shed to an elaborate architectural chapel in which the coffin rests while the first part of the burial service is read, before the corpse is borne to the grave or vault. The same syllable appears in Lichfield.

Lick Observatory, a department of the University of California. It was built in 1876 on the summit of Mount Hamilton about twenty-six miles by road from San Jose. It is situated in a tract of about 3,000 acres granted by the government. The observatory was founded by virtue of a bequest made by James Lick. He was a wealthy piano manufacturer of Philadelphia. He invested his earnings largely in California real estate. In 1874 he placed property worth $3,000,000 in the hands of trustees with instructions that $700,000 should be used in purchasing and housing "a telescope superior to and more powerful than any telescope yet made." The site described has proved satisfactory. The summit of the mountain was blasted away to secure a level platform. The air is clear. The site being remote from railway trains is without tremors. The observatory and the great telescope and its accessories cost about $610,000. The lenses were cast in Paris and ground by Clark, the telescope maker of Cambridge, Massachusetts. The objective lens is thirty-six inches in diameter and has a focal length of fifty-six feet and two inches. The telescope tube alone weighs three tons. The observatory is equipped thoroughly with photographic apparatus. Those in charge are engaged constantly in making photographic maps of the heavens and in recording observations. Among the positive discoveries made may be mentioned a fifth satellite of Jupiter and a dozen or more comets. Important observations have been made of the sun and of the moon. About 5,000 visitors a year are admitted.

Licorice or **Liquorice,** lĭk'ō-rĭs, a plant of the pea family. The name in its original Greek form means sweet-root. The licorice plant grows from three to four feet high. It is sparingly branched. Pinnate leaves bear 8 to 12 pairs of leaflets. The flowers are of a violet color. The roots, or else the root-stocks, are the valuable part of the plant. They are long, limber, and slender. At the end of three or four years the crop is ready to dig. The roots may be dried and broken into twigs and sent to market in bundles, or an extract may be obtained from them by boiling, bruising, straining, and evaporating. When evaporated, the juice dries into a brilliant black solid. A stick of pure licorice breaks with a shiny fracture and may be dissolved wholly in water. Ordinarily stick licorice is adulterated heavily with starch.

As a medicine, licorice is considered an excellent remedy for colds. As a matter of fact, its chief service lies in soothing the irritated surface of the bronchial tubes, thus enabling nature to effect a cure. Licorice is used also to perfume the breath. Chaucer's miller "cheweth lycorys to smellen sweete." Licorice is raised very generally in the countries of southern Europe. The dry root is worth from one to possibly

eight cents a pound. Two to three cents is regarded a fair price. Spain used to supply the world with licorice, but the center of cultivation has moved eastward. The chief licorice producing countries are Turkey, Russia, Italy, Greece and Spain. The cultivation of licorice was attempted in the United States, chiefly in California and Louisiana, but did not succeed.

Lictor, among the Romans, a civil officer, who attended upon the consuls or chief magistrates when they appeared in public. One of the duties of a lictor was to inflict corporal and capital punishment. During the reign of the kings of Rome, the lictors were 12 in number, and served as personal attendants of the king. During the first century of the Empire the emperor was attended by 12 lictors. Lictors were also assigned to the religious functionaries, and vestal virgins going through the streets were accompanied by a lictor. They wore the toga, and walked in single file, each bearing on his shoulder the *fasces,* bundles of birch rods, having among them an ax with the blade projecting, as a badge of authority. It was also their duty to scourge offenders, and to see that the authority of the magistrate was respected.

Lie, lē, **Jonas** (1833-1908), a Norwegian novelist. He was born at Eker, Norway. He was educated for the law at Christiania, but, after a few years of scanty practice, he betook himself to journalism and literature. His first novel, *The Visionary,* appeared in 1870. He traveled in the far North and wrote various volumes of Norse tales, including *Stories and Sketches of Norway, Life in the North,* and *The Pilot and his Wife.* In 1874 he was made the recipient of a literary pension which enabled him to travel extensively in Europe. Subsequent volumes were *Thomas Ross, Adam Schrader, Rutland, Scenes of the Sea, Life's Slaves, The Family of Gilje, The Gulf, Two Lives,* and *Mischievous Powers.* Lie published a volume of poems in 1867 and is the author of several dramas, including *Grabow's Cat* and *Merry Wives.* His most important critical work is a volume on *Honoré de Balzac.* Lie's works have been translated widely into English and German. He himself would say that his greatest success has been attained in dealing with marriage and other social institutions, but the reading public will remember him best for his earlier simple sketches of Norwegian life.

Liebig, lee'big, **Justus** (1803-1873), an eminent German scientist. He was born at Darmstadt 1803. First a student, then an apothecary, then a student again, he studied in Paris with Gay-Lussac, became professor of chemistry at Giessen, and ended his days, in 1873, as a professor of chemistry in the University of Munich. Liebig was famous not only as a chemist but as a teacher, and drew students from all over the world. Many young Americans went to Giessen and Munich to profit by his instruction and bring home his ideas. Liebig is considered the father of the laboratory method of teaching. Laboratories for research were numerous, but laboratories for students—for beginners—were an innovation.

Liebig laid the foundation for scientific agriculture by showing that plants draw their nourishment from the mineral constituents of air and soil. Corn demands certain constituents and drains the soil of these constituents, which must be replaced or corn can not be grown. As well try to dip water from an empty barrel as to try to raise corn on soil from which corn-growing material has been exhausted. Manures, applied to land, decompose, that is, break up into plant food and make soil fertile again. A farmer who takes from his soil and does not put back will sooner or later have a poor, unproductive farm. Manures are valuable, not because they have been a part of animal or plant life, but because they break up into minerals. The right minerals, even though they have not been parts of animals or plants, are just as desirable. Pure lime, for instance, fresh from the kiln, is a valuable field dressing in proper quantities. All these statements now seem axiomatic, but they were not clear in Liebig's day.

Liebig and his immediate disciples placed human food or diet on a scientific foundation. The classification of foods given in a school physiology is practically that established by Liebig—food for bone, food for muscle, and food for bodily heat. Some foods furnish many needed elements; some few. Milk is the one article of diet that supplies all needed elements. Liebig taught

Rocket, line and breeches buoy.

A lifeboat afloat.

Launching the lifeboat.

LIFE SAVING APPARATUS.

chat lean meat preserved by salting loses a large part of its nutritive value, being then in about the condition of meat that has been used for soup. Liebig's "extract of beef" and "children's food" are important articles of diet for sale everywhere. The particular value of the extract lies in the possibility of transportation under circumstances which render the carriage of fresh meat an impossibility. The valuable part of beef could be brought to Europe from far off Australia and Argentina in tin cans or glazed earthen jars. The invention of refrigerator ships and refrigerator cars has superseded the Liebig method in part.

Liebig's services to the chemist by way of inventing apparatus and methods of work are too technical and extensive for this place. His friend and student, Hoffman, says: "If we sum up in our minds all that Liebig did for the good of mankind,—in industries, in agriculture, and in the laws of health,—we may confidently assert that no other man of learning, in his course through the world, has ever left a more valuable legacy behind him."

Liechtenstein, a principality lying between Austria and Switzerland. In 1806 it was a member of the Rhine Confederation. After the Napoleonic wars it formed a part of the German Confederation; but since the breakup in 1866 the principality has been theoretically independent. The legislature is a diet of fifteen members, three appointed by the prince, twelve selected by vote. Area, sixty-five square miles. Population, 10,716. The prince resides in Austria, where he has extensive estates. The largest town has 1,142 inhabitants. The inhabitants are engaged in rearing cattle. Other products of the country are corn, wine, fruit, and timber. The people are chiefly Roman Catholics. On November 7, 1918, the Diet established the complete independence of Liechtenstein.

Liege, lē-āzh, the capital of a Belgian province of that name. It is located in a district noted for coal and iron mines, and for dairying. Butter and Limburger cheese are exported in large quantities. The city is situated on the Meuse. There are fine wharves and bridges. The city was captured by the Germans, August 7, 1914, and remained in their possession until late in 1918. The city was seriously damaged during the siege. Liege is a manufacturing city of importance. It is noted for cannon, firearms, locomotives, hardware, cutlery, watches, jewelry, bronze articles, as well as for woolens, cotton goods, and laces. Population 169,700.

Lien, lēn, a right to detain or hold the property of another until the debt due from him is paid. The mender of a clock is entitled to retain it until his proper charges are paid. A horseshoer may retain the animal until the just cost of shoeing has been tendered him. A blacksmith may hold a wagon until repairs have been paid for. In most states, carpenters, plasterers, and other workmen are given a thirty or sixty days' lien by law on the building on which they have worked. Even though the owner of the building should sell, the lien is a prior claim until the time of its expiration. Workmen in a lumber camp or in a sawmill have a lien on the logs and lumber. The several states set a time limit.

Lifeboat, a boat kept at a seaside station to rescue persons from shipwreck. The modern lifeboat is thirty-three feet in length and eight feet in width. It is weighted so that it will right itself immediately if upset, and is provided with relieving tubes, a most ingenious contrivance, by means of which any water that breaks into the boat is discharged at once. It possesses great strength and is capable of carrying a large number of passengers. The lifeboat is to the station what the engine is to the firehouse. It is kept on trucks, ready for a run to any accessible portion of the coast. The carriage is an admirable contrivance. The members of the crew take their position in the boat; the carriage is then run out into the surf and the boat is launched amid breakers that would prove the destruction of a boat attempting to get away from the shore. These boats are so well constructed and so capable of riding in a rough sea that they are considered safe. Life is seldom lost in connection with their management. Lifeboats are kept in life-saving stations in which a discipline is maintained like that in engine houses. Each lifeboat has a master and several surfmen. In the United States there are nearly 300 of these stations on the Pacific, the Atlantic, and Gulf

coasts. They are connected usually by telephones. They are equipped with lifeboats, signal guns, life preservers, and all sorts of devices for saving life and property. Among other contrivances is the life rocket, a projectile carrying a rope. It may be fired from a mortar in such a way as to carry the line to a distressed ship. See BOAT.

Life Insurance. See INSURANCE, LIFE.

Life Preservers, devices for the saving of life in case of shipwreck. Civilized nations require each ship to carry life belts sufficient with which to equip every passenger and member of the crew. They are constructed usually of cork inclosed in canvas. When one is buckled around the waist it is impossible for the wearer to sink. In fact, they are required by law to be buoyant enough to support the heaviest person with another clinging to him. There are other inventions, as pillows and india rubber jackets. Some ships are provided with what are known as cork mattresses or cork rafts, capable of floating three people. See CORK.

Life Saving Service. See COAST GUARD.

Liggett, Hunter (1857-), an American general, commander of the First Corps of the Army, which won the Battle of St. Mihiel in September, 1918. He was born at Reading, Pa., and educated at West Point Military Academy. Upon his graduation he was appointed second lieutenant of infantry. He took an active part in the campaign in the Philippines. He was instructor in the War College and a member of the general staff. He was appointed major-general in March, 1918, and accompanied General Pershing to France, was raised to the rank of lieutenant-general during the war. Upon the reorganization of the army after the Battle of St. Mihiel, Liggett was given command of the First Army. He was the first officer in the United States Army to command more than 1,000,000 men.

Light is caused by radiant energy and is that portion of radiant energy that produces visible objects. Scientists are agreed that all space is filled with ether which transmits radiant energy. Some of this radiant energy produces heat, some light, both of which pass through a vacuum as readily as through the air in the form of waves. Each is the result of a form of wave motion. Light waves vary from sound waves in that they are transverse to the direction in which the light travels. Sound waves coincide with the direction in which the sound travels.

VELOCITY. As demonstrated in 1926 this is 186,173 miles a second in air. Light could circle the earth's equator 7.478 times in a second. For all appreciable distances the transmission of light is instantaneous. Its velocity in water is about three-fourths of that in the air. This velocity varies in other substances. In general, the more dense the substance the lower the velocity.

TRANSMISSION. Light is transmitted in straight lines through a medium of uniform density. For this reason we can not see through a bent tube or around the corner of a house. When light passes from one medium to another of different density it is bent out of its course, or refracted. The handle of a spoon in clear tea seems bent on the surface of the liquid; a stick standing in clear water presents a similar phenomenon. This is because the rays of light are bent on entering the denser medium. The law of refraction is:

Light passing from a rare to a dense medium is bent toward the perpendicular to the surface of that medium. Conversely, light passing from dense to rare medium is bent from the perpendicular.

We always see the object in the direction of the refracted rays. Consequently, we behold the sun before it appears above the horizon in the morning and after it has actually set, at night. The bottom of a vessel containing water appears higher than it actually is for the same reason. Optical instruments, such as spectacles, telescopes, field glasses and microscopes are constructed in accordance with these laws of reflection. (See LENS.)

REFLECTION. When a beam of light strikes a polished surface it is reflected, as in case of a mirror. The law of reflection is:

The angle of the reflection is equal to the angle of incidence.

That is, if the rays of light strike a mirror at the angle of 45° they will be re-

flected at an agle of 45°. One standing directly in front of a mirror receives the reflected rays at right angles to its surface. One standing at one side of the mirror beholds his image in a similar position back of the mirror. Many illustrations of this fact can easily be found. All objects reflect some light, except those that are black.

Diffusion. When light strikes other surfaces such as wood, cloth or unglazed paper the rays are scattered or diversified and this enables us not only to see the object but it also aids in seeing other objects, because the diffused light tends to spread evenly over the room.

Intensity. Some objects like the sun, the stars or a gas jet are self-luminous. The intensity of light proceeding from them diminishes with the distance from the luminous body in the ratio of the square of the distance. Place two objects so that the light from a gas jet will fall upon them. Let one be two feet from the gas jet and the other four feet. The second object will receive only one-fourth the light that the first receives. For this reason objects at a distance do not appear in distinct outline.

The Spectrum. The colors which appear in the rainbow combine to produce white light. These different colors are due to the different wave lengths, red having the longest waves and violet the shortest, but these colors do not represent all of the wave lengths in a beam of white light. Beyond the red are waves which produce heat; beyond the violet are rays which have intense chemical activity, and it is due to these waves that the impression is made upon a photographic plate, while the X-rays, though not definitely visible, enable photographs to be taken through opaque objects. Some authorities consider the X-rays to be more closely identified with electricity than with light. See X-Rays.

Lighthouse, a structure in which a light is maintained at night for the guidance or warning of sailors. The earlier lighthouses were built usually on dangerous shoals, points, or rocks to warn off vessels. Now they are maintained as well to show the way into harbors. About 331 B. C. a beacon tower for the guidance of mariners was built on the Isle of Pharos at the entrance to the port of Alexandria, Egypt. It was called the Pharos, a name applied to lighthouses ever since. The Phoenicians, and after them the Romans, erected lighthouses at various points frequented by their ships about the Mediterranean and along the Atlantic coast. A Phoenician lighthouse at Corunna, Spain, has been repaired from time to time and is still in use. The remains of a Roman Pharos are still to be seen at Dover, England. The most celebrated lighthouses of Great Britain are those of the Eddystone, Bell Rock, and the Skerryvore. One of the most noted in the United States is that on Minot's Ledge, off the coast of Massachusetts.

The heaviest waves are said to strike with a force equivalent to three and one-half tons per square foot. It is necessary, therefore, that a lighthouse in an exposed situation should be heavy and possess great strength. Granite, concrete, and iron are the principal materials used. The construction, particularly the laying of the foundation, is often attended with great difficulty. The restless waves permitted General Alexander, the builder of the lighthouse on Minot's Ledge, only thirty hours' work in the first year. A typical granite lighthouse is 140 feet in height and has a base from 40 to 50 feet in diameter. It is drawn in more rapidly at first, then it tapers with a uniform slant to the top, which is about 16 feet in diameter. To give the waves the least possible hold on the building, it is made circular in outline. Such an edifice contains from 50,000 to 60,000 cubic feet of masonry and weighs over 4,000 tons. A lighthouse on Spectacle Reef in Lake Huron cost $300,000. A very ordinary station costs $50,000.

At the beginning of the nineteenth century there were hardly to exceed a score of lighthouses in England. Nearly 900 now guard the waters of Great Britain and Ireland. In the United States there are about 5,756 lighthouses, light buoys, or light ships and fog signals. There are about 600 on the Great Lakes. Four keepers are usually assigned to an American lighthouse. Three tend the lights, while one is ashore. They

take turns in relieving each other, so that each keeper has two weeks ashore and six in the lighthouse.

The earlier lighthouses were mere beacons on the tops of which fires of wood or oil were kept burning; in fact, coal fires, some of them burning 300 or 400 tons annually, were depended upon in Great Britain as late as the first quarter of the nineteenth century. They were not discontinued in continental Europe until the middle of the century. One hundred years ago the Eddystone lighthouse had a chandelier of tallow candles burning within a reflector of glass mirrors.

Oil and electricity are now employed. The Barnegat station at the eastern point of New Jersey, guarding the entrance to New York Harbor, has an electric light plant operated by steam capable of generating 30,000,000 candle power. The light used is a 6,000 candle power arc light. It passes through a bull's-eye eighteen inches in diameter and may be seen twenty miles away. Were it not for the curvature of the earth's surface, it might be seen at a distance of one hundred miles. Various devices have been adopted for distinguishing the different lights. Flashes at different intervals, as well as colored lights, enable the mariner going from Charleston, South Carolina, to Boston, for instance, to distinguish every lighthouse on the coast. Even though he should be driven out of his course into absolute darkness and beat up toward land again, he recognizes the lights at once, and is as certain of his course as the woodsman who catches sight of a familiar tree, hill, or body of water. The signals shown at every rock or harbor are recorded. The lights of Sandy Hook, for instance, may be identified by the intelligent shipmaster from any part of the world.

Lightning, the discharge of electricity passing from cloud to cloud or from a cloud to the earth. In 1751 Franklin showed that a stroke of lightning is to be compared with the discharge of a Leyden jar. The two clouds or the cloud and the earth may be regarded as the two coatings, inner and outer, of the jar, while the air is the glass that separates them.

Observers divide discharges of lightning into three classes, sheet, ball, and chain or bolt lightning. The first is a momentary illumination of the face of a cloud or of the atmosphere. It is merely the reflection of lightning, otherwise concealed. Fiery balls or globes, possibly of air or moisture lighted by electricity, have been known to roll or float along near the surface of the earth and to explode without effect. St. Elmo's fire, a flame occasionally seen clinging to the tips of masts of ships, has been referred to this form of discharge. Something of the sort has been seen, it is claimed, on mountain peaks, having the form of a lambent flame several inches in length.

It is held that ordinary discharges of lightning, sometimes seemingly miles in length, are in reality a series of short discharges succeeding each other too rapidly for the eye to separate them. The zigzag course of a bolt is the more readily understood with this explanation. The crash produced by the passage of a stroke is an atmospheric disturbance produced by heat. The air in the path of the bolt is heated and expanded, forcing the adjacent air violently outward. The waves set up by the returning particles meet at the line of passage with a loud noise like the report of a cannon. It is not to be understood that the lightning forces the air out, or forms a vacuum in the line of its passage, but that it swells the air suddenly. See ELECTRICITY; FRANKLIN.

Lignite. See COAL.

Lignum Vitae, lĭg′nŭm vī′tē (wood of life) the wood of a tree of the West Indies and Venezuela. It is of a brownish-green color. It is exceedingly hard, tough, and durable; and is much used for rulers, balls for bowling, pulley-sheaves, and the mortars used by chemists in which to grind substances with a pestle.

Li Hung Chang (1823-1901), a distinguished Chinese statesman and diplomatist. He passed through the usual course of Chinese education, consisting largely of memorizing precepts and the writings of the learned. He is said to have outdistanced 15,000 competitors in his examination for admission to high government employ. He occupied almost every position in the government service from secretary of an official to prime minister of the em-

pire. Unlike the typical Chinese officeholder, he was ever on the alert to learn new ideas—military, industrial, or commercial—from outsiders. From "Chinese" Gordon he learned many valuable ideas of military organization. He introduced machine shops, cotton mills, a bicycle factory, and telegraph lines. He caused coal mines to be opened and arsenals to be built. He had a number of coast defenses constructed and equipped with modern guns. He purchased a number of gunboats and ironclads. He authorized the construction of several railroads, and established schools diligently throughout the empire. He was without doubt the most intelligent, far-seeing, progressive statesman that China has produced within the last five centuries.

Lilac, an ornamental shrub of the olive family, somewhat related to the ash. It is a showy shrub, with fine pyramids of fragrant flowers of the delicate purple color to which they have given a name. Lilacs are a trifle old-fashioned, but the fashion of planting lilac bushes is nevertheless a good one. Our cultivated varieties are from the Caucasus, the Himalayas, China, and Japan.

Lille, a manufacturing city and fortress of France, chief city of the department of Nord, is situated on one of the tributaries of the Scheldt, about 14 miles from Paris. The city receives its name from the castle around which it originally arose, which was situated in the midst of marshes, and was called *L'Isle.*

Lille is one of the most important industrial cities of France. There are numerous establishments where linen, velvet, silk, ribbons and knit goods are manufactured, other large industrial plants produce chemicals, soap, sugar, finished lumber, oil and tobacco.

The town is practically modern, there being few ancient buildings. There are several fine churches that contain noteworthy paintings by our masters, a number of universities and lyceums, and several schools of art. There is a communal library here of over 100,000 volumes, and over 1,500 manuscripts.

Lille was founded in the 11th century by the counts of Flanders, and in the 12th century was noted for its extensive linen industry. The town has been the center of many political feuds, and it has been occupied at different periods by foreign armies. Population, 1920, 217,807.

Lilliput, lil'i-put, in Swift's *Gulliver's Travels,* the name of an imaginary kingdom, whose inhabitants were no larger than a man's finger. See GULLIVER'S TRAVELS.

Lily, genus of plants which gives its name to a family of 2,000 species. The foliage of a lily is seldom striking, but the plant as a whole is stately and eminently graceful. The flowers are bellshaped, with six tips usually turning well outward, or even recurved. It is difficult to classify the various shapes and colors. Easter lilies are pure white, emblematical of the resurrection. They were introduced from Bermuda about 1875. Florists are skillful in securing fine flowers at exactly the right date. A number of our wild lilies are exceedingly handsome. The lily of the valley is a hardy, dainty little plant belonging to this family. If once started in a garden it will take care of itself. See ASPARAGUS; ONION; LEEK; NARCISSUS; HYACINTH; TUBEROSE.

Lily of the Valley. See LILY.

Lima, Ohio, the county seat of Allen County, is situated on the Ottawa River and on several railroads, 81 miles south of Toledo. It is in the heart of the rich oil and gas fields of northwestern Ohio, and large quantities of crude and refined oil are annually shipped out. The city also contains extensive railroad shops, locomotive and car works, machine shops and two large motor truck plants. The Ohio State Hospital for the Criminal Insane, one of the largest institutions of its kind in the world, is located here. There are fine public schools with two junior and senior high schools. The city owns and operates the water works. In 1920 the population was 41,326.

Lima, lē'mä, the capital city of Peru. It is located on the Rimac River, seven miles from the Pacific. Callao, at the mouth of the river, is the seaport. Railroads lead from Lima to Callao and other coast points. A railway extends from Lima to Concepcion far up on the Andes. Lima was founded by Pizarro in 1535. The old city

was surrounded by adobe walls, after the fashion of European cities. They were removed in 1870 to make room for handsome boulevards. The city is well laid out, chiefly in squares. Buildings are usually of one story, as the city is subject to earthquakes. Lima has long been considered a city of considerable culture and refinement. In 1880 the national library was destroyed. A new library has been built, almost as large as the old one, but many old books, treasures in their way, cannot be replaced. The casual visitor would be interested in an amphitheater for bullfights, accommodating 9,000 spectators. The fish market of the city attracts 1,000 housewives with their market baskets daily. There is a marble statue of Columbus unveiling a figure of America, and a bronze equestrian statue of Simon Bolivar, the Liberator. Pizarro lies buried in the Cathedral. There are manufactures of tallow candles, glue, gold lace, silver filigree, and coarse woolen fabrics. The population was 176,467 in 1920. See PERU.

Lime, a well known building material. Good lime is a nearly pure compound of calcium and oxygen. It is prepared from limestone, marble, chalk, and shells, by burning. The simplest form of a limekiln is a low, wide, chimney-like structure built of brick or even large blocks of limestone. The kiln is filled up with broken limestone. Care is taken, by constructing a rude temporary arch, to leave a large hollow place at the bottom. Fuel is introduced through a door at one side. The doorway and spaces of air leading up through the broken stone afford a fine draft. A small fire, usually of wood, is made under the arch. The temperature is raised slowly for a few hours at first to prevent the arch from crumbling or caving in; then a furious fire is built, and the whole mass is kept at a full red heat for two days to roast out the carbon contained in the limestone. Ordinarily 100 pounds of limestone yield fifty or sixty pounds of lime; but the chunks of lime retain the form of the stone with not to exceed ten to twelve per cent loss of bulk. Freshly burned lime is a caustic, and burns the fingers and clothing. For that reason it is called quicklime. The purer the lime the whiter it is.

When exposed to air, lime slakes, that is, absorbs water and falls into a powder. Lime is usually supplied with water and allowed to slake for a day or two, a week is better, before it is used for mortar. The mason mixes his slaked lime with sand and hair, the former for hardness in the finished wall. As soon as the water dries out the mortar sets, forming a sort of artificial sandstone, in which the grains of sand are cemented together by lime. The plasterer adds hair to give toughness to his wall. When applied to lath, the mortar curves over behind the lath, and when dry binds the plaster to the wall. Ordinary mortar will not harden while damp, but, if the limestone contains a certain amount of clay and is burned slowly, a hydraulic lime is produced which hardens or sets while still moist.

Slaking is accompanied by the evolution of great heat. A cargo of unslaked lime must be guarded from water, for ships, cars, and warehouses are not infrequently set on fire by a leak which admits water to a mass of lime. Emperor William of Germany has his hunting lunches served hot by means of an outer and an inner can, the space between being filled with unslaked lime. In this way, he avoids building a fire in the woods.

In addition to its use in mortar and cement, lime is required in bleaching cotton goods, in purifying illuminating gas, in making soda, in purifying sugar, in tanning, in glass making, in disinfecting, and in the manufacture of many chemicals. It is used extensively to restore fertility to worn-out land. If a piece of litmus paper be wrapped about a handful of moist earth it will indicate the condition of the soil. If the litmus turn red, the soil is sour, and may be improved by an application of air-slaked lime.

Lime may be produced wherever suitable limestone or marble and cheap fuel are to be found.

See CALCIUM; BONE; LIMESTONE; GYPSUM; ALABASTER.

Lime, a small tree or shrub, a member of the orange tribe. The tree is low, much branched, and thorny. It thrives in a stonier, poorer soil than its relatives, the orange and the lemon, but it is damaged

more readily by frost. It is a native of southeastern Asia, but has spread to all tropical countries. The American market is supplied by Florida and the West Indies. The lime is cultivated in orchards. It also grows wild, forming thorny thickets, after the manner of the plum. The fruit is smaller and more globular than the lemon. It is prized by the inhabitants of tropical countries for making cooling drinks, resembling our lemonade. See ORANGE, LEMON.

Limelight. See CALCIUM.

Limerick, the seat and the chief town of the county of that name in southern Ireland. It is situated on both sides of the Shannon, at the head of deep water navigation. It is about fifty miles due north from Cork. Limerick was one of the early centers of Irish civilization. It was the seat of the kings of north Munster. In 1174 it was seized by the English, and was converted by them into one of the strongest fortifications in Ireland. In importance, it is the fourth port of Ireland. The shores of the Shannon are provided with quays and floating docks. The river is spanned by numerous bridges. The city is the seat of linen, lace, and glove industries. There are large breweries, distilleries, tanneries, and flour mills. The population in 1920 was reported at about 38,518. Although Limerick is a traditional Irish name, and is, in the popular mind, a type of all that is Irish, the city itself, like Dublin, is essentially English. See CORK; KILLARNEY; IRELAND.

Limestone, a well known and widely distributed rock. It consists chiefly of carbonate of lime. Magnesium, iron oxide, alumina, and silica are usually present. Most limestones are formed in comparatively shallow, clear seas by the accumulation of shells. Some of these shells are so small that they require a microscope to make them out. Coral and shells of mollusks contribute largely. Sometimes limy materials are ground to a fine ooze before they consolidate. Sometimes they remain almost entire. A close examination of a limestone will reveal usually a large number of fossils, ranging in size from the head of a pin to shells several feet in length or diameter. Some of the later limestones are a mere mass of shells. The varieties of limestone are endless. Some are pure white, others yellow, others are blue, and others again, when stained with bitumen, are black. Under great heat and pressure limestone is converted frequently into marble of various colors, sometimes beautifully mottled. Chalk is a soft, powdery limestone. Some limestones are so full of sand that it is difficult to distinguish them from sandstones. At the other end of the series, they pass into marls and shales. Disintegrating limestone makes rich soil. The famous blue grass region of Kentucky and other sections owe their reputation to an underlying layer of limestone that disintegrates just fast enough to feed the soil. Crops grown on a limestone soil withstand early frosts and drought well. Our limestone quarries lead those of all other countries in money value. For some of the purposes to which limestone is put, see MARBLE; LIME; CEMENT.

Limoges, lē-mōzh′, a French city about 250 miles southwest from Paris. It is a city with a history. It was a post of considerable importance when Gaul was occupied by the Romans. In the fifth century it was devastated by the Vandals and the Visigoths. In 1370 the Black Prince took it by assault and gave it up to fire and sword. The most celebrated building is the cathedral, dating from 1273. The main portal, bell tower, organ loft, glass windows, and a number of frescoes are worthy of note. The city possesses a museum of painting and sculpture, and an extensive collection of pottery. There are numerous woolen and cotton mills, paper works, and foundries. Shoemaking is an important industry. Clogs, or wooden shoes, are made here. The timber for the purpose comes down the river Vienne. The principal industry of the city, however, is the manufacture of porcelain. The kaolin or porcelain clay obtained in the vicinity is unrivaled even by that of China. There were lately no less than thirty-five porcelain factories with eighty furnaces, employing several thousand workmen. Eight hundred artists devote their time to ornamentation.

Limpet, a small, conical shellfish. The shell is much like that of one-half of a clamshell surrounded by a leathery fringe

or border. The limpet fills the shell and clings by its exposed side to a rock. By raising the middle of its body slightly it creates "suction" and is held so firmly to the rock by atmospheric pressure that it is not easy to pick it off. At low tide British fishermen gather limpets for bait, and millions are collected on the Irish coast for food. Limpets go about when the tide is in, feeding on seaweeds which they rasp away with a rough file-like tongue. It is said a limpet "homes," or returns to the same spot on a rock, till it oftentimes wears a depression.

Lincoln, Abraham, the sixteenth president of the United States. He was born in Hardin County, Kentucky, February 12, 1809. He died in Washington, D. C., April 15, 1865. The Lincolns were English Quakers. Grandfather Abraham Lincoln, after whom the president was named, was a Virginian of some property. About 1780 he moved to Kentucky with three sons. He settled near his friend and relative, Daniel Boone. He was shot in his clearing by an Indian. Thomas, the youngest son, grew up to be a carpenter. In 1806 he married Nancy Hanks, the handsome young daughter of his employer. School facilities in those days were limited. Thomas himself could not read. He was barely able to scrawl his signature. Nancy was able to read and write. She was a sprightly woman of superior character.

Thomas Lincoln appears to have been an indolent, shiftless sort of a man. He settled on a poor piece of land near Hodgensville and sank into poverty. The house in which the family lived was built of logs. It had one room. The floor was bare ground, trodden hard. There was one low doorway and a small square hole cut through the wall for a window. The window was without glass; the doorway without a door. In winter a deerskin was nailed over the window and a bearskin was hung across the doorway. The fireplace and chimney were built of sticks and stones plastered with clay. The furniture consisted of a pole bedstead in one corner of the shack; blocks of wood served for chairs; a rude bench stood by the fireplace, a broad puncheon, or split log, standing on pole legs, was the only table.

Here Nancy Hanks and her shiftless husband made their home, and here Abraham Lincoln was born. He was a fine, strong, contented child. He lay in a bed of furs staring at the rafters and cracks of light overhead. Even among her neighbors Mrs. Lincoln had a reputation as an efficient housekeeper. Her hearth was always swept, her cabin tidy, her children clean. She sheared her own sheep and spun the wool into cloth. She was her own tailor and seamstress. She helped her husband in the field with axe and hoe. Game abounded, and she was a sure shot with the rifle. She taught Abraham to read and made him familiar with Bible stories. At five years of age he could read and talk better than some of the overgrown young men of the settlement.

In 1816 when Abraham was about seven years old, Thomas Lincoln borrowed two horses, packed his family and household belongings on their backs and started on a long, tiresome journey to Indiana. He had heard that the soil was richer and that a new settlement near Gentryville offered a better chance for a poor man. The first winter in Indiana was passed in a hastily built shed, inclosed on three sides and open toward the south. A large camp fire was kept burning in front to beat off the cold. A patch of ground was cleared for a cornfield, and a year later the family moved with great satisfaction into a log house. It was years before windows, floors, and doors were provided. Abraham remembered afterward that three-legged stools in place of blocks were considered a great improvement in the family furniture. The house was provided also with an attic in which Abraham slept. He climbed up and down by means of wooden pegs driven into the wall. His bed was a pile of dry leaves and bearskins. The surrounding country was full of game, deer, bear, and wild turkeys. He learned to use a rifle.

In 1818 the Lincoln settlement, as it was known, was visited by an epidemic that carried off a number of the settlers. Thomas Lincoln was the carpenter and made the coffins. He whipped his own lumber out of logs from the neighboring forest. Nancy Lincoln was among the number who had to go. She bade her chil-

dren farewell and was buried under a spreading sycamore tree. The following summer Abraham sent over one hundred miles for a traveling preacher to come and preach his mother's funeral sermon. Years afterward, when a public man, he used to say, "All that I am, or hope to be, I owe to my angel mother."

The next year Thomas Lincoln went back to Kentucky and returned with a second wife, a Sarah Bush Johnson, a widow with some little property. She brought with her a four horse team, six chairs, a table, a bureau, a chest, a feather bed, and pillows—luxuries that the ragged Lincoln children had never seen or dreamed of. The second Mrs. Lincoln had two children of her own, but she took Abraham and his older sister Sarah to her heart. She clothed them warmly, provided them with comfortable beds, and made her husband bestir himself to provide windows and doors. An era of comparative prosperity dawned upon the Lincoln family. Abe worked faithfully, clearing, providing game, and helping the stepmother about the house. Speaking of him after he had grown to be a man, she said, "Abe never gave me a cross word or look, and never refused to do anything I asked him. Abe was the best boy I ever saw or expect to see."

Young Abraham had very little schooling, less than a year all put together, but during all these years of hardship and work he was hungry for reading matter. He read the Bible through and through. He would walk miles to borrow a book. On one occasion a borrowed volume was left too near a crack in the house and became spoiled by the rain. Abe worked for the neighbor to pay for it. From short terms of school he got some little inkling of arithmetic. For want of a slate—paper and lead pencils being unknown—he ciphered on a wooden shovel with a piece of charcoal. When the surface became covered with figures, he whittled them off with a jackknife. He managed in some way to get a very elementary knowledge of grammar. He learned enough of the rudiments of surveying to run lines for the neighbors.

He grew up to be a gaunt, homely young man. He was six feet, four inches in height. His head was large and well poised. His features were neither handsome nor forbidding. His nose was slightly Roman; his mouth wide cut. Through life he had a dark, weather-beaten complexion. He was strong and active, a "powerful hand" at logging bees. He was fond of running, wrestling, and pitching weights, and had an inexhaustible fund of quaint stories. He was a peaceable young man, utterly without physical fear. He took the side of the unfortunate and the oppressed. He held the bullies of the neighborhood in check. No bullying of the weak was possible when Abe was around. He grew up with the reputation of being very fair and square.

In 1830 Thomas Lincoln decided to move again, this time to the state of Illinois. He settled in a prairie country near Decatur. Abraham, who was now twenty-one years old, remained with the family long enough to assist in building a house, in breaking up fifteen acres of land, and in surrounding it with a rail fence. The future president then engaged in a variety of occupations. He made two trips to New Orleans with a flatboat, returning full of arguments against slavery. In 1832 he was made captain of a company of volunteers enlisted for the Black Hawk War. Many years afterward, in relating his experience, he said, "I saw no live, fighting Indians, but I had a great many struggles with the mosquitoes." He tried storekeeping. His partner proved to be a worthless, drunken man. The business failed. It was many years before Lincoln was able to pay the last of the debts. In 1832 he was the Whig candidate from Sangamon County for the legislature, but he was defeated by the Democratic candidate. Judge Logan, with whom he afterward studied law, said of him, "He was a very tall, gawky, rough looking fellow then; his pantaloons didn't meet his shoes by six inches, but he made a very honest, sensible speech."

Lincoln had a strong desire to get into politics. In 1834 he was again a candidate for the legislature, this time successfully. He became acquainted with Stephen A. Douglas, his future rival, and took a part in the moving of the capital of Illinois

from Vandalia to Springfield. In the meantime Lincoln had been studying law. He formed a partnership with an old lawyer and opened an office in the new capital. Lincoln was a politician and an effective public speaker, but he never became learned in the law. Instead of studying law books, he sat with his heels on a table, reading literature. In trying a case he paid very little attention to points of law. He preferred to carry the case straight to the jury on questions of right and wrong. His law practice was never large, but it enabled him to meet family expenses. In 1838 he was sent to the legislature, this time from Springfield, and was returned again in 1840. He took an active part in the Whig campaign of that year, stumping the state in favor of William Henry Harrison. His ability to hold and please a political audience was so marked that he became a leading man in the Whig party.

In 1842 he married Miss Mary Todd, a young lady from Kentucky who happened to be visiting at Springfield. After boarding for a year or two at a hotel they moved into a small frame house which they occupied until Lincoln's election to the presidency. In 1846 an ambition of long standing was gratified by his election to Congress. He was the only Whig from the state of Illinois. Stephen A. Douglas was one of the two state senators. In Congress Lincoln made the acquaintance of Webster, John C. Calhoun, Jefferson Davis, and other famous public men of the time. He supported a bill for the abolition of slave trade in the city of Washington, and voted forty times in favor of the Wilmot Proviso. He was opposed to the declaration of war with Mexico, but he was in favor of sending supplies liberally to the boys who were in the ranks. He took part in every political campaign. Stephen A. Douglas, the "darling of the Democracy," was his chief rival. The Suckers, as the people of Illinois were called, termed Douglas the "Little Giant," and Lincoln, "Honest Abe."

In 1856 Lincoln took part in the formation of the Republican Party. He supported John C. Fremont for president. The joint debates between Lincoln and Douglas attracted national attention. In 1860 Lincoln was talked of as a presidential possibility. Seward, with the great state of New York and the East behind him, was the leading candidate. Some of Seward's supporters were unwise enough to refer to Lincoln's want of education and to the rail-splitting days of his youth. John Hanks, an old neighbor, a relative of Lincoln's mother, walked into the convention with two of the old rails that Lincoln had split. He mounted with them to the platform and displayed a banner calling upon the delegates to vote for Abe Lincoln, the railsplitter of Sangamon County. The convention went wild with enthusiasm. The "railsplitter" was nominated, and, owing to a division of the Democracy, the "railsplitter" was elected president.

Although during the campaign Lincoln had made a statement that, if elected, he would not interfere with slavery where it then existed, excitement in the South rose to a fever heat. As the time of his inauguration approached it became evident that the Southern states would secede from the Union. His life was threatened. In order to avoid trouble he was smuggled through Baltimore to Washington by night. When bidding farewell to his friends at Springfield he said, "I go to assume a task more difficult than that which has devolved upon any other man since the days of Washington."

In his inaugural speech, delivered from the steps of the national capitol, March 4, 1861, Lincoln said, addressing himself to the South, "In your hands, my dissatisfied countrymen, and not in mine, is the momentous issue of civil war. The Government will not assail you. You can have no conflict without being yourselves the aggressors. You have no oath registered in heaven to destroy the government; while I have the most solemn one to 'preserve, protect, and defend' it."

With the exception of a term in Congress Lincoln took up the duties of president an untried public man. Residents of Washington, foreign ambassadors, influential people generally, accustomed to men of greater polish, were disposed to make sport of his awkward, homely ways. Even the leaders of the Republican party felt that he was unequal to the situation, and that

they ought to tell him what to do. Lincoln invited these leaders to become members of his first cabinet. William H. Seward was made secretary of state, Salmon P. Chase, secretary of the treasury, and Simon Cameron, secretary of war. They found him ready to accept advice, but to their astonishment they soon found that there was a point at which he took the reins in his own hands and compelled them all to follow his directions.

It is difficult to believe that a public man ever passed through more trying experiences than did Lincoln during the Civil War. He tried in the first place to avert war with the South. He had sworn to defend the Constitution and to preserve the Union. He had to reconcile the warring elements of the Republican party, to restrain hot-headed advocates of immediate abolition, to pacify, if possible, the leaders of the South, to meet armed opposition to the government with force, to fill an empty treasury, to form an army without officers, to arm and equip soldiers without guns or military supplies, and to organize armies without competent military leaders.

To realize Lincoln's position it should be understood that a great war was never undertaken under more embarrassing circumstances of selfishness, jealousy, incompetency, and want of preparation. In the midst of his greatest responsibilities, when the fate of the Union seemed resting on the appointment of the right commander or the event of a battle, Lincoln was likely to be interrupted by importunate delegations in the interests of rival candidates for some village postoffice. He was too kindhearted, too considerate. As the war drew on, lines of care furrowed his homely face. The death of his favorite son, Willie, added private grief to the burden he was carrying for the nation. The horrors of warfare weighed upon his spirits. Tenderhearted and kind, he could not bear to think of sending thousands and thousands of men to their death, and yet he felt that the war must be carried on.

He was accessible to people of every degree. Cabinet officers, congressmen, and generals laid their plans before him. Delegations appointed and self-appointed waited upon him to urge their views. He came and went like the most ordinary citizen. The veriest darkey that scrubbed the steps was able to have audience with "Massa" Lincoln. The wife whose husband lay languishing in some far-off prison did not come in vain to ask for exchange or furlough. The mother, whose weary son fell asleep on the sentry's beat and had been condemned to be shot for neglect of duty, came to see Lincoln, and went away, her eyes streaming with tears of thankfulness. The most brilliant mind in the nation could not sway Lincoln from the dictates of common sense. His integrity could not be shaken; his sense of justice could not be perverted, but he was compassionate and merciful. The spirit in which he carried on the war may be known best from his own words in his second inaugural speech:

"Fondly do we hope, fervently do we pray, that this mighty scourge of war may speedily pass away. Yet, if God wills that it continue until all the wealth piled by the bondsman's two hundred and fifty years of unrequited toil shall be sunk, and until every drop of blood drawn with the lash shall be paid by another drawn with the sword, as was said three thousand years ago, so, still it must be said that the judgments of the Lord are true and righteous altogether. With malice towards none, with charity for all, with firmness in the right as God gives us to see the right, let us finish the work we are in, to bind up the nation's wounds, to care for him who shall have borne the battle, and for his widow and his orphans, to do all which may achieve and cherish a just and a lasting peace among ourselves and with all nations."

Should the reader marvel at the beauty of this language and wonder where an unschooled man learned it, the key may be found in the old Bible that Nancy Hanks taught her boy to read in that lowly Kentucky cabin fifty years gone by.

April 9, 1865, two soldiers met at Appomattox Court House to conclude terms of peace. Lee's veterans in gray turned their faces toward their desolate homesteads; Grant's boys in blue turned their faces northward. The South was glad that the one-sided struggle was over; the North was jubilant with success. Lincoln's heart lifted. The Union was saved. His thoughts turned toward new problems, but, unknown to himself, his work was ended.

Only six days later, on the eve of Good Friday, April 14, Lincoln accompanied his family to Ford's Theater in Washington.

About ten o'clock, John Wilkes Booth, a crazed actor, who hoped to win immortal fame in the thought of the South, entered the presidential box, placed a pistol against the president's head, fired, leaped to the stage, and made his escape. With a smile on his lips, the president fell unconscious. He was taken to a house near by, but never knew what had happened to him. His cabinet and family gathered around his bedside. When the sun rose next morning Lincoln had passed away.

Persons still living tell how the news of Lincoln's death spread like a pall over the nation. The newspapers came out with black borders; bells were tolled; flags were displayed at half mast; places of business were closed. The farmer left his plow in midfurrow; the mechanic laid aside his tools. People had no heart to work. Private funeral exercises were held Wednesday, the 19th, in the East room of the White House. The funeral procession then wended its way down Pennsylvania Avenue. The hearse, drawn by six gray horses, was preceded by twenty pall-bearers, selected from Congress, the army, the navy, and from civil life. The remains lay in state under the dome of the capitol the rest of that day and all night. Thousands upon thousands, senators and newsboys, took their last leave of Lincoln. Old soldiers hobbled forth from the hospitals to gaze for the last time on the face of their commander-in-chief.

Without doubt it would have been Lincoln's wish to be buried at Springfield. A special funeral train was made up. The president's remains were placed on view in a car draped with black. Guards stood at each corner of the casket with drawn swords. A slow schedule of running time was drawn up and adhered to. An engine ran ahead to clear the track. It was the most remarkable funeral procession ever held in the United States. In populous districts the train moved at a snail's pace. The entire population for miles and miles flocked to catch a last glimpse. The train moved literally between living walls for hundreds of miles. At Philadelphia a pause was made. The casket was carried to Independence Hall, where it lay for a day. At New York the remains lay in state in the City Hall. At Albany 50,000 people visited the state capitol. Special exercises were held and the remains were placed on view at Cleveland, Columbus, and Chicago. On the third of May the train reached Springfield. Appropriate exercises were held in the hall of the House of Representatives, and Lincoln was laid at rest in Oak Ridge Cemetery.

In 1874 a beautiful monument was unveiled in his honor. Perhaps no truer tribute was paid to him than by General Grant who on that day said, "To know him personally was to love and respect him for his great qualities of heart and head. In his death, the nation lost its greatest hero. In his death, the South lost its most just friend." No other American was ever mourned as was our martyr president. He was a man of the people. He rose from obscurity into eminence. He was a man of integrity and ability; his hand was at the helm during the most perilous period of our national existence; but the reason for such profound and universal grief must be sought in the fact that, somehow, in the death of Abraham Lincoln each individual felt that he had lost a just, a wise, a patient personal friend.

It was said of Washington that he was "First in war, first in peace, and first in the hearts of his countrymen"; but the last phrase belongs peculiarly to Lincoln. Beyond all doubt Abraham Lincoln is the most beloved of all Americans. There are, it may be, sections of the country in which he is not appreciated fully, but he is beyond controversy the first of Americans. Washington is respected; Franklin is commended; Jefferson is admired; but Lincoln is beloved.

In 1909 a memorial building was erected at the place of his birth. The Lincoln Park and the Lincoln statue of Chicago are tributes.

See DOUGLAS; BOOTH; GETTYSBURG; PRESIDENTS; HAY; SEWARD; CIVIL WAR.

He knew to bide his time,
  And can his fame abide,
Still patient in his simple faith sublime,
  Till the wise years decide.
Great captains, with their guns and drums,
  Disturb our judgment for the hour,
But at last silence comes;
  These all are gone, and standing like a tower,

Our children shall behold his fame,
The kindly, earnest, brave, foreseeing man,
Sagacious, patient, dreading praise, not blame,
New birth of our new soil, the first American.
—Lowell, *Commemoration Ode.*

Lincoln, Robert Todd (1843-1926), the eldest son of Abraham Lincoln, and a successful lawyer and business man. He was educated at Phillips Exeter Academy and at Harvard which he left to serve as captain on General Grant's staff in the Civil War. Later he finished his law course at Harvard, and practiced in Chicago. He was secretary of war in the cabinets of Garfield and Arthur, and served as minister to Great Britain from 1889-93. Afterward he became associated with the Pullman Palace Car Company as legal adviser and finally as its president.

Lincoln, the capital of the English county of that name. It is situated in a region noted for grazing and agriculture. The Lincolnshire sheep originated here. The village of Boston, for which the Massachusetts city was named, is in this county. The Lincolnshire fens are noted in history, but they have been drained and converted into fertile fields. The city has an inland situation on a small river, the Witham. It is about thirty miles from the North Sea. It is one of the most ancient cities in Great Britain. It was a military post during the days of Roman occupancy. The limits of the Roman fortifications may still be traced. Many Roman coins and other antiquities are found in improving the streets. An old Roman gate, found eleven feet below the present level of the street, is considered one of the most perfect specimens of genuine Roman architecture in England. An old military road leads straight north from it for twelve miles. The glory of the city is Lincoln Cathedral, a Gothic minster begun in 1086. Admirers claim that it is the earliest purely Gothic building in Europe. It formerly had three spires, but one of them was blown down in 1547, and the others have been removed lest they fall and crush the building. The body of the cathedral is 480 by eighty feet in size. The great bell, known as Great Tom of Lincoln, weighs 10,800 pounds. A considerable knowledge of architecture would be required to appreciate a description of the ground plan, portals, stairs, screens, nave, transept, choir, and lady chapels. The edifice is built of durable limestone. One might spend days in studying the wonderful carvings and stained glass windows, and then feel that he had made but a beginning.

Lincoln, the capital of Nebraska. It is situated in the eastern part of the state in a rich farming country. Twelve railroads center there, this fact making Lincoln the seat of numerous state conventions. The streets are broad, well lighted, and lined with pleasant homes. Though the city is more of an educational than a commercial center there are a number of manufactories, producing leather goods, creamery and meat products, paints and oils, ready-made clothing, bed springs and mattresses. The distributing business is very extensive, that of farm machinery being the largest in the west. Lumber, coal, and grain are handled in great quantities; there are many stockyards. The leading educational institutions are the University of Nebraska, Nebraska Wesleyan University, Cotner University, Union College, a military school, and three conservatories of music. The state and county buildings, five libraries, and several philanthropic institutions are of interest. The census of 1920 gave Lincoln a population of 54,948.

Lincoln Highway. See ROAD.

Lincoln Memorial. On Decoration Day, May 30, 1922, the beautiful Lincoln Memorial was dedicated at Washington, D. C. The dedication ceremonial was befittingly simple, a worthy tribute to a great American. Chief Justice Taft presented the memorial to the Government, and President Harding accepted it, both paying eloquent tribute to their immortal predecessor.

In presenting the memorial, Chief Justice Taft said:

Here is a shrine at which all can worship, here an altar upon which the supreme sacrifice was made in the cause of liberty, here a sacred religious refuge in which those who love country and love God can find inspiration and repose.

President Harding's address to the gathered throng was deeply moving. Speaking of Lincoln as man and statesman, the President said:

His work was so colossal that none will dispute that he was incomparably the greatest of our Presidents. He came to authority when the Republic was beset with foes at home and abroad, and reestabliished union and security. He took his advisers from among his rivals, invoked their patriotism and ignored their plottings. He dominated them by the sheer greatness of his intellect, the singleness and honesty of his purpose, and made them responsive to his hand for the accomplishment of the exalted purpose. Amid it all there was a gentleness, a kindness, a sympathetic sorrow which suggests a divine intent to blend mercy with power in supreme attainment.

Other speakers followed. Dr. Robert Moton of Tuskegee Institute, speaking for twelve million of the colored race said:

A race that produced a Frederick Douglass in the midst of slavery and a Booker Washington in the aftermath of reconstruction has gone far to justify its emancipation.

The poet, Edwin Markham, read his poem, *Lincoln, the Man of the People,* which closes with the lines:

And when he fell, in whirlwind he went down,
As when a lordly cedar green with boughs,
Goes down with a great shout upon the hills,
And leaves a lonesome place against the sky.

The memorial building is of white marble, and is one of the finest works of architecture in America. It has thirty-six Doric columns in the purest style of Grecian architecture, representing the States of the Union at the time Lincoln was President. Above the columns are forty-eight sculptured festoons typifying the States of the Union as now constituted. The building stands at the end of the Mall, and is in beautiful harmony with the Capitol, on the east, and with Washington Monument, a short distance away.

The memorial is in Potomac park; behind it flows the Potomac; and it is watched over by the peaceful Virginia hills. For its erection, a broad plain set in an amphitheatre of hills was chosen: and by means of terraces the ground was raised until the floor of the building was forty-five feet higher than the original grade level. The memorial is reached by a series of steps built from a marble platform 204 feet long and 134 feet wide.

The memorial hall is 156 feet long and 84 feet wide; the colonnade is 188 feet long and 118 feet wide; and the columns are 44 feet high. The floors and walls of the hall are of colored marble.

The statue of Lincoln is a seated figure, of heroic proportions, raised a few feet above the floor. The great Emancipator's character—his patience, his strength, his gentleness and intelligence—have been faithfully expressed by the sculptor. Behind the statue is the inscription:

IN THIS TEMPLE, AS IN THE HEARTS OF THE PEOPLE FOR WHOM HE SAVED THE UNION, THE MEMORY OF ABRAHAM LINCOLN IS FOREVER ENSHRINED.

On the walls, at the right and left, are the Gettysburg speech and the Second Inaugural Address, cut into the stone. Above these are the mural paintings, subdued in color, and just relieving the classic coldness of the interior. In these murals, the artist has told allegorically of the ideals of Lincoln's life. There are six groups, each against a background of cypress trees, symbols of eternity.

A subdued light, light sifted through thin slabs of marble, suffuses the interior, and falls like a quiet benison upon the great silent figure below.

Lind, Jenny (1820-1887), a Swedish singer. She was born at Stockholm and died in England. She was educated in the Stockholm Conservatory of Music, and after obtaining some reputation, she studied and sang in Paris, Berlin, Dresden, Leipsic, and Vienna. In 1847 she made a tour of England with remarkable success. In 1850 P. T. Barnum, the American showman, brought her to New York under contract to sing for 150 nights at $1,000 an evening, and expenses for herself and troupe. Barnum took in over $700,000. The excitement rose to such a pitch that the first ticket sold in Providence, Rhode Island, was put up at auction and was bid in at $760. This amount was paid by a wealthy man who was willing to spend that sum for the advertising it gave him. In 1852 Miss Lind married Otto Goldschmidt of Boston, and ceased to accept engagements, though giving her money and time freely for worthy causes. She made her home finally in the vicinity of London. In 1894 a bust was unveiled in her honor in Westminster Abbey.

Jenny Lind possessed one of the sweetest voices the world has ever heard. It was a brilliant, thrilling soprano, remarkably sympathetic and of great range, and her rendering of coloratura has never been equalled.

Lindsay, Ontario, an industrial city and the county town of Victoria County, is situated on the Scugog River, 69 miles northeast of Toronto, on the Canadian Pacific and the Canadian National railroads. The Scugog is navigable, and Lindsay has steamer connection with the Trent Valley Canal, providing an easy outlet for the products of the city's manufactories. These include munitions (a government arsenal is located here), machinery, chemicals, milk foods, woolens, flour, lumber, boots and shoes, and numerous other articles. Lindsay has four primary schools, a collegiate institute, a convent, a business college and a library. The city had a population of 7,620 in 1921.

Lindsey, Benjamin Barr, (1869-), an American jurist, best known as a promoter of the Juvenile Court, and as a political reformer. He was born in Jackson, Tennessee, where he lived until he was seventeen, the last few years with his grandmother, for his family had moved to Denver. Then he was called to Denver by the death of his father. The burden of the family—his mother and three other children—fell upon him. He went to work in an office at ten dollars a month, carried papers in the morning, and did janitor work in the evening. After the day's work he studied law, for which he had a veritable passion. This overwork and worry had its effect upon his health, threatening physical and mental collapse. His affairs soon brightened, and in a few years he and a friend had a law office of their own; but the grinding experiences of his early life left him with an unfailing sympathy for everyone in trouble, particularly children. In 1901 the young lawyer was appointed to fill an unexpired term of nine months as judge of the county court. One day while hearing the regular round of cases he was asked to try a "larceny" case that would take but a moment. A frightened little Italian boy was brought in, and charged with stealing coal from the tracks. Judge Lindsey, thinking there was nothing else to do, sentenced him to the Reform School. But as he was making out the papers a shriek from the back of the room arrested him. There was the boy's mother, overcome with terror and despair. The judge's heart was touched, and, acting on his own authority, he put the boy on probation and went home with him and his mother. There he found the father sick in bed in a filthy shack, the whole family facing starvation. The boy had seen his mother and the baby suffer from cold, and he had brought coal from the railroad tracks to warm them.

This was the beginning of the now famous Denver Juvenile Court. Judge Lindsey was set to thinking on the absurdity of classing such offenders as the helpless Italian child with adult criminals, and as a result he began investigation in the hope of bettering matters. He found children herded in prisons with hardened criminals where they were taught every vice and crime; he found boys being ruined in gambling dens and young girls in dance halls. Judge Lindsey appealed to the city government, but as has been the case in so many large cities, the officials were indifferent. Then he began an investigation; he got the "jail" children to tell their story before a gathering of public men, and finally aroused the public interest. The city council established a detention school where the delinquent children might be kept apart, also public playgrounds, and public baths; the legislature passed a law establishing a juvenile court which, with later modifications, has made the Colorado Juvenile Court a model. Judge Lindsey was elected twice for a four year term, but in 1908 it looked as though the machine element would defeat him. Then "the kids" whom he had befriended plead in public meetings for his reëlection; they paraded the streets shouting for Lindsey And the "Kid Judge" was elected by a large majority. He is now judge of the Juvenile Court of Denver, wholly devoted to cases dealing with children. It has served as a model for many other such courts throughout not only this country but the world.

His court is based on the principle that delinquent children should be treated, not

as criminals, but as "wards of the state needing aid . . . and encouragement." That these children are worth encouraging he has proved beyond doubt. Most of them he places on probation in accordance with another leading principle of the court, and enlists the help of parents, teachers, and other "grown-ups." The children report to him regularly, and he takes a lively interest in their work. They come to him and tell their own misdeeds, asking him for a "square deal," and help in "keeping straight." Never does he fail them. Denver is full of boys who might have been "toughs," but who, thanks to him, are growing into good citizens. The boys who have to be committed to the Reform School at Golden he sends without a guard. Out of 200 such boys less than half a dozen failed him, and most of these went soon afterward of their own accord. Other unique features of this court are the fact that all children under twenty-one may be tried there; that it can summon, and punish if necessary, any person who has offended against the welfare of a child. Hence it enforces such laws as the child-labor law, the law against cruelty to children, the law against the sale of liquor or tobacco to minors, that concerning the appointment of guardians for children—in short, it has authority in every possible case concerning a child. Juvenile Courts in other cities are founded upon the same principles, though they vary with local conditions in the manner of conducting the court. In the city of New York, for instance, where there are so many delinquent children, the session of court is much more formal than in the smaller city of Denver. The story of the first Juvenile Court and of his fight with the corporations is told in Judge Lindsey's book of 1910, *The Beast and the Jungle.*

Linen, a general name for yarn spun or cloth woven from the fibers of the flax plant. The fiber is obtained by processes similar to those employed in working hemp. Linen fibers are unusually even, soft, and flossy. Linen makes the softest and, in many respects, the most beautiful cloth known. It is thought to be the most ancient textile. It is certain that there is no other fabric which has such a history or such a part in the world's history as linen. Its softness, its luster, its durability, and that peculiar quality which causes it to be associated in the mind with absolute cleanliness, have, in all ages and among all people, won for this fabric a place among textiles which no other product of the loom has ever attained. From time immemorial linen has formed the robe of priesthood and the hangings of the temple. A "fair linen cloth," the symbol of purity, covers the altar and the consecrated elements on the communion table. Linen has been regarded as fit clothing for kings and princes; new born babes have been dressed in it; and no more honorable method of preparing the dead for burial has been found than to wrap the body in "a clean linen cloth."

In India, Egypt, and Babylon, the manufacture of linens reached great perfection at a very early period. Egyptian mummies have been found swathed in as many as forty thicknesses of linen. Some of these mummy wrappings are of linen finer than anything that can now be produced. One piece has been found in the wrappings of a mummy which counts 540 warp threads to the inch, while the finest ever woven in Europe counts but 350.

France, Belgium, and Holland each acquired an early reputation for the production of linen. The revocation of the Edict of Nantes drove many French linen weavers abroad and contributed to the establishment of the industry in the British Isles. Irish linens are celebrated for fineness and beauty. Belfast and Armagh are centers of Irish linen making. Linens are manufactured extensively at Leeds, England. A single room in one of the factories is said to cover two acres. Dundee, Scotland, is another linen center. Lisle is the best known linen center of France. Considerable linen is manufactured in Russian Poland. Most of the linen used in America for men's furnishing goods and for napkins, tablecloths, handkerchiefs, toweling, and dress goods is imported from Great Britain. A duty ranging from forty to sixty per cent of the original cost is added.

A large amount of flax is raised in the United States and Canada. The seed is pressed for linseed oil. Thread, binding twine, and coarse toweling are made from

the fibre, but the greater part of the flax straw is thrown away. Attempts to make the finer grades of linen here have not proved profitable.

The beauty of linen depends upon the evenness and fineness of the thread and upon the density of the fabric. An appearance of density is produced often by calendering, which flattens the threads. Consequently a "round thread" linen is regarded as preferable, for its density is a result of weaving and not of finishing.

The use of the power loom in the weaving of linen has been attended with greater difficulty than in the weaving of wool or cotton. This is due to the hardness and inelasticity of the threads, which cause the wefts to break frequently under the sudden jerk with which the shuttle is thrown in power loom weaving. On this account, many fine linens are woven still by hand.

The various species of textiles which come under the denomination of linens are damask, cambric, lawn, batiste, diaper, toweling, sheeting, canvas, and duck. As all of these goods are now made in cotton it is customary to prefix the qualifying word linen to the various names if the fabrics are products of flax.

Ling. See HEATH.

Ling, a fish of the codfish family. It has a long body, with two back fins. The front fin is much the shorter. A barbel is attached to the chin. The lower jaw and palate are armed with large teeth. The usual length is from three to four feet, but ling from five to six feet in length and weighing seventy pounds have been taken. The ling is found in the North Atlantic as far south as the coast of Spain. It is taken chiefly in the German Ocean off the coasts of Great Britain, Ireland, Norway, and Denmark. During the summer it remains in deep water, but during the winter months it approaches the shore and is taken by means of long lines. Ling are also taken in the waters of Greenland and Newfoundland. Ling is prepared for market either by salting down or by splitting and drying. It is one of the favorite fishes on the continent during the season of Lent.

Lingard, John (1771-1851), an English historian. He was educated for the priesthood at the English university at Douay, France, and had charge of a Roman Catholic parish at Newcastle-upon-Tyne. He was a man of scholarship and loyalty to the British crown. He declined a cardinal's hat from the pope, and accepted a pension of $1,500 a year from Queen Victoria. His first published work of importance was *Catholic Loyalty Vindicated.* This appeared in 1805, and was followed by *Antiquities of the Anglo-Saxon Church.* The work on which his reputation rests chiefly is a *History of England from the Invasion of the Romans to the Year 1688.* It appeared in 1819-30 in eight volumes. Many subsequent editions have been published. This work was a revelation to the reading public, long accustomed to English history written from a Protestant and partisan point of view. It has the reputation of being a clear and, for the time, impartial and accurate presentation of the Catholic side of a long controversy. Protestant readers were surprised that so much could be said on the side of the Catholics. This work had a powerful influence in leading historians to examine both sides of a question before writing. For instance, Lingard taught the people of England that the monasteries suppressed by the Reformation were something more than nests of iniquity occupied by lazy drones. He showed that they were centers of learning and hospitality as well, and that they were the chief maintainers of hospitals in which the sick, regardless of religious creed, might obtain proper care and medical attendance. He demonstrated that, in the destruction of English monasteries, crafty politicians and hungry court hangers-on, desirous of rich lands and livings, were not actuated wholly by zeal for a pure religious belief.

Linlithgow, a county town eighteen miles west of Edinburgh. It is prominent in history and literature, owing to the fact that it was long a favorite royal residence. The ruins of Linlithgow Palace are considered the finest of the kind in Scotland. The palace stood on a promontory extending into a lake. It was almost square in outline. The buildings inclosed a court ninety-one by eighty-eight feet in size, in the center of which stood a fine fountain. At every corner there was a tower with an interior spiral staircase. The northwest

angle is crowned by a little eight-sided turret, known as "Queen Margaret's Bower," the name arising from the tradition that she sat and watched there for the return of her husband, James IV, from the fatal field of Flodden. In his *Marmion* Scott refers to this tradition,

> The Queen sits lone in Lithgow pile,
> And weeps the weary day.

James V and his daughter, Mary, Queen of Scots, were born in this palace. The Scottish Parliament occasionally held its meetings here. In 1645-6 the year of the plague, the university of Edinburgh took refuge at Linlithgow. In 1745 Prince Charlie passed through the town. The palace was burned by Hawley's dragoons in the following year.

Linnaeus, lin-nē'ŭs, **Carl** (1707-1778), a noted Swedish botanist. His boyhood was passed in pleasant surroundings in southern Sweden in a district of fine meadows, valleys, lakes, and woods, all abounding in wild flowers. He inherited a love of flowers from his father, a village pastor. The elder Linnaeus designed Carl for the ministry and maintained him at school for twelve years, to no purpose, as he began to think. The young man showed the greatest distaste for theology, and lagged far behind in Greek, Hebrew, and ethics. In mathematics he did well; in physics he excelled. While neglecting his school work he contrived to collect quite a botanical library for that time.

The worthy clergyman, inquiring after his son's progress, was told that "the little botanist," as he was nicknamed, showed no proficiency, and might as well be apprenticed forthwith to some honest tailor or shoemaker. Fortunately a physician, a friend of the family, took a different view of the matter and, receiving Carl into his family, guided his reading and secured his admission into the University of Lund. A few years later Linnaeus completed a course in medicine at the University of Upsala, but never made much of his profession. Tramping and collecting were his passion, and he was made a sort of assistant to the professor of botany. From a five months' trip afoot in Lapland and adjacent parts of Norway he returned with a wealth of specimens and 100 plants new to science. A wealthy banker of Amsterdam employed Linnaeus to set his greenhouses and grounds in order, and gave him the means to visit Oxford and London, where he made the acquaintance of botanists and examined collections. Paris and Leyden were also visited to advantage.

In 1738 Linnaeus settled down, as he believed, at Stockholm to practice medicine. He was fortunate enough to effect a cure of some importance, and found himself a man of note. Honors were showered upon him, and, above all, his growing reputation was sufficient to secure the professorship of botany at Upsala, 1741. His work as a young man all told; his writings were received with acclaim. Contributions to the botanical garden of Upsala poured in. New plants were sent him to name, students flocked from other parts of Europe to be with so great a teacher, and Linnaeus became by accord the recognized head of the botanical world.

Linnaeus' value as a botanist lay in his zeal and accuracy. New plants were described in Latin so that botanists of all countries might understand each other. Whenever a capital "L" is attached to the scientific name of a plant, it indicates that the name was given by Linnaeus. Thus *Lobelia Kalmii, L,* indicates that Linnaeus named this lobelia, and in honor of his friend Kalm.

Linnaeus is chiefly known as the author of the Linnaean system of classification. His system is an easy one to follow. Flowering plants are divided into classes according to the number of stamens the flowers have, and classes are subdivided into orders according to the number of styles or stigmas. Thus a plant with six stamens and three stigmas, like the wild orange-red lily, is said to belong to the third order of the sixth class of flowering plants; and the bluebell with five stamens and three stigmas would be classified under class five, order three. The Linnaean system was artificial. It over-emphasized stamens and pistils and did not always group plants according to their natural affinity. Wintergreens, trailing arbutus, and the blueberries have ten stamens, while their natural relative, the bog cranberry, has but eight, and

the pea, utterly unrelated, has the same number. This system was superseded about the middle of the nineteenth century.

The twin flower is a slender vine that creeps through the mosses of the moist shaded bogs of Northern Europe and of America from Maine to Alaska. On threadlike pedicles, forking at the top, a pair of delicate nodding purple and whitish bells of exquisite fragrance hang nodding half a hand's breadth above the moss. This tiny representative of the honeysuckle family is one of the most beautiful little plants that grows and, being hidden away in the shade, is particularly the botanist's delight. Linnaeus was passionately fond of this flower. After his death, his former associates changed its name to Linnaea, the most delicate honor that could be paid to the great botanist. By common consent of scientists and despite all rules in favor of the earliest name given a plant the name Linnaea has been retained. The name of Linnaeus is thus beautifully commemorated wherever the twin flower swings its tiny bells. Emerson, enumerating the delights of the botanist, says:

He saw beneath dim aisles, in odorous beds,
The slight Linnaea hang its twin-born heads,
And blessed the monument of the man of flowers,
Which breathes his sweet fame through the northern bowers

Linnet, a common song bird of the finch or sparrow family. It is native to Europe and the adjacent regions of Asia and Africa. It is a migratory bird. In the spring, when it makes its appearance in England, the head and breast of the male are of a bright crimson. As autumn approaches the plumage becomes brown streaked and dull. In this respect the linnet is much like our bobolink, of which, indeed, it is a relative. The first syllable of the name is the *lin* of *linen,* which also appears in *lint.* The Scotch call it the lintie and the lintwhite, no doubt because it is fond of linseed. The habits of the bird are much like those of the American goldfinch. The linnet is much prized as a cage bird. It is sociable and friendly, and has a clear, flute-like note. It requires much the same food and care as a canary. The people of the Black Forest in Germany are skilled in breeding linnets and in teaching them to sing.

Linoleum, a particularly durable variety of floor-cloth made of oxidized linseed oil and ground cork. It was invented in England in 1860, and was brought out under the name of kamptulicon. When, later, an improved variety was produced, it was given the name of linoleum, a word made up from *linum,* flax, and *oleum,* oil. Floor oilcloths are frequently called linoleums, but are manufactured by a different process and are far inferior. The foundation of linoleum is a strong jute canvas, varying in width from three to twenty-four feet. The cork used in its manufacture is for the most part the waste from the manufacture of bottle corks. It is crushed with great difficulty, owing to its elasticity and the rapidity with which it blunts the hardest steel knife edge. A specially constructed machine, however, reduces the cork to small pieces, which are afterward ground to powder. Boiled linseed oil is pumped to the top of a high building and allowed to flow downward over pieces of light cotton scrim which are hung from iron bars. The building is heated to aid in the oxidization and the layer of oil on the scrim becomes gummy and solid within twenty-four hours. This operation is repeated daily for several weeks until the mass of oxidized oil is about one-half an inch thick. These "skins," as they are called, are cut down from the sheets of scrim and ground between rollers. This ground oil is then mixed with resin, kauri gum, and the ground cork. Coloring matter is added, if desired. While hot, this mixture is placed in a feeding box and delivered in a fine shower directly on the surface of the canvas. It then passes immediately between powerful, smooth rollers that press the mixture into the jute and cause it to adhere firmly. A waterproof coating of oil and paint completes the process.

Linoleums of this sort are of one color. Others are printed in colors with oil paint. The printing, however, wears off quickly. In recent years a method has been perfected by which linoleums are made in patterns, the colors extending throughout the entire thickness. This is called inlaid linoleum, and costs from twenty to fifty cents more per yard to manufacture than does the plain. Over 2,000,000 yards of inlaid linoleum were manufactured in the United

States in 1920. Linoleum deadens noise, is easily cleaned, and wears well. It is used extensively for kitchen floors and in the aisles of libraries and buildings of similar character. In many public buildings it has replaced carpets. See OILCLOTH; FLAX.

Linotype, līn′ŏ-tīp, a machine invented to do the work of a compositor or typesetter. It is not a typesetting machine, but produces a metal bar or slug having in relief on its edge the letters or characters from which to print a line of a newspaper or book. The machine is much too complicated for description, but its principal features are a magazine for storing the matrices from which the letters on the slug are cast; a keyboard like that of a typewriter which releases the matrices in the order they are required; a pot or vessel heated by gas which contains the molten metal used in casting the slug; and the machinery and devices necessary to assemble the matrices in their order and convey them to the caster and back again to the magazine. Each letter on the keyboard has a corresponding groove or channel in the magazine, and when the key is depressed the matrix is released and conveyed by a traveling belt to the assembling point. Spaces between the words are provided for by spacebands, which fall into place when the spacebar of the keyboard is depressed. The matrices are assembled one by one, spaces being inserted as required. After enough matrices to make a line are assembled, they are automatically conveyed, on depressing a lever, to the casting mechanism where the line is justified or spaced out. This is done by means of the spacebands, which, as they are thrust upward, widen the spaces between the words forming the line of matrices uniformly from top to bottom until the line is of the required length. The heated metal is then forced by the stroke of a pump through small holes into a mold, the front of which is formed by the assembled line of matrices. After the cast is made the matrices and spacebands are separated, the spacebands deposited in a channel provided for their reception, and the matrices carried to the rear of the magazine and distributed, each letter in its own groove, by means of conveyor screws. Each slug as it is cast is shaved off and the superfluous metal removed. The slugs are deposited consecutively in a galley in the order in which they will appear on the printed page. The linotype is operated by a single person, who will ordinarily produce slugs equivalent to the type set by five hand compositors. The average rate is between 4,000 and 5,000 ems per hour, although this is exceeded, one operator having made a record of 13,287 ems per hour for eight hours.

The linotype is run by steam, electricity, or other power, a minimum of one-quarter horsepower being required for each machine. Lines of any sized type from five to thirty-six point can be produced, and of any length from five to thirty-six ems of pica, or from one to six inches. Each matrix has two dies cut in its face, one above the other, and the mechanism is such that the operator can produce at will Roman and italic or Roman and boldface letters, or the line may be part Roman and part italic or part Roman and part boldface. By setting in by hand matrices of other kinds as small caps, German, Greek, mathematical signs, etc., other characters may be introduced. The magazine can be removed readily from the machine and others containing different sized or different faced letters substituted therefor. Some machines have two, three or even four magazines, one above the other, from either of which lines may be assembled. Matrices are now cut of all styles of faces in general use for newspaper and bookwork.

The linotype was invented by Ottmar Mergenthaler (1854-1899), a German-American clockmaker of Baltimore, Maryland, and on his account is frequently called a mergenthaler. The invention was perfected in 1886. The first newspaper to use it was the *New York Tribune.* There are now over 14,000 American-built linotypes in daily use throughout the world. The composition of all daily papers published and of nearly 1,500 high grade periodicals and trade journals is now done with a linotype, and it is in use in practically all the large book offices in America. A less complicated and cheaper machine constructed on the same principle, and known as the Junior Linotype, is manufactured for use in country newspaper offices and other small establishments.

Other Typesetting Machines. Before the invention of the Mergenthaler linotype machine, which revolutionized the art of printing in America, many inventors in Europe and America had sought to solve the problem of mechanical typesetting, as composition and distribution of type by hand are tedious and expensive processes. One of the earliest devices was patented in England in 1822 by Dr. William Church. His machine cast types and placed them in reservoirs, from which they were set as required by pressing keys on a keyboard something like that of a piano. Distribution was avoided by remelting the types after use. Twenty years afterward another machine appeared in England which was successful in setting type at a good rate, but the arrangement, and "justification" of the lines required the services of two persons besides the operator, and distribution required another.

The first American distributing machine was patented in 1843, and a long series of inventions of typesetting or typecasting machines and distributors followed, including those of Alden, Mitchell, Paige, Kastenbein, Burr, Thorne, MacMillan and Lanston; while English, French, German, Danish, and other foreign inventors were also busy with the problem. The Kastenbein machine was used by the London *Times* in 1869 and the Burr machine by the New York *Tribune* in 1880, but the greatest successes were achieved by Thorne, MacMillan, Lanston and Mergenthaler. The Thorne machine, which was exhibited at the Paris Exposition in 1878, was an ingenious combined typesetting and distributing machine, and was closely resembled by a later machine called the Simplex. MacMillan's device performed the operations of setting and distributing the types by separate machines. Both the Thorne and the MacMillan machines used types previously cast by the regular typefounding process. The Mergenthaler linotype, as already noted, and the Lanston machine, called the monotype, cast their own type as required, the former in lines or "slugs" and the latter in separate letters, points, signs and spaces. See Monotype.

Linseed. See Flax; Paint.

Lion, the largest and most powerful animal of the cat family. A well grown male measures about nine feet from the end of the nose to the end of the tail, the tail being about one-third of the total length. The male is of a tawny yellowish color, and may be distinguished from the female or lioness by its greater size, and by a shaggy, flowing mane which imparts an appearance of great majesty and strength. The lion has a powerful muscular frame and a large head with an intelligent, almost human face. It carries itself in a proud, fearless way that has gained for it the well merited name "king of the beasts." It is preëminently a hunter. It has the eyes and claws of a cat. It keeps the hours of a cat. It stalks its prey like a cat, springing upon antelopes and even giraffes with a terrific roar. It will not touch carrion unless driven by excessive hunger. Dr. Livingstone's *Travels,* and DuChaillu's *Explorations and Adventures in Equatorial Africa* give many authentic anecdotes of the way the lion hunts and is hunted. Speaking of the lion's roar, the former makes the remarkable assertion that it can be told from the call of the ostrich only by the fact that it is heard at night.

If remains in the floors of limestone caverns are to be credited, the lion ranged over half of Europe. Within historical times, it was common in the Mediterranean countries of Europe and in Asia Minor, Egypt, and the region between the Mediterranean Sea and the Sahara Desert. The lion is now seldom found, however, north of the Sahara. A few lions are still found in Arabia, Persia, and India. They are smaller than the African lion. The male is almost without a mane. He is altogether an inferior looking animal. There appear to be two species. The Boer settlers found great numbers of the African lion in the Cape region, but their rifles have exterminated both the lion and the wild game on which it fed. The region of the world in which lions are now most numerous is said to be the vicinity of Mount Kilimanjaro, southern Abyssinia, and Uganda.

The lioness brings forth from two to four spotted whelps. Great care is taken to make a grassy lair deep in some thicket

surrounded by a jungle of cane, grape vines, and thorns. Formerly, when a lion was desired for a menagerie, a pit was dug and baited with a live goat. The adult lion, when taken, was thrust into a cage and transported at great expense and no little danger. Nowadays trappers locate the lion's lair and watch their opportunity. When the parents are away on a hunt for game, the hunters steal in and take the cubs. If caught in the act by the returning lions, the hunters must use their spears and rifles promptly. The rage of the lioness in defense of her young is proverbial. If taken young enough, and taught to suckle a rubber-nippled bottle, the little whelps can be carried, like kittens, in a basket for thousands of miles. A lion reaches its full size in about five or six years. A full grown lion is worth $1,000 in Hamburg or New York.

The lion is an intelligent animal and may be taught many tricks. A Swiss lion trainer who had pleased the king of Abyssinia was presented with thirty-two live lions. He brought twenty-four of them safely to Europe in cages. He taught his lions to climb on each other's shoulders and form pyramids, as well as to perform many other interesting tricks. He gave exhibitions in the principal cities.

Of all wild animals, the lion occupies the largest place in literature and in history. The winged lion of St. Mark's is the peculiar device of Venice. The lion has long been the emblem of England. The political writers of America are quite given to "twisting the tail of the British lion." In heraldry the lion is variously represented. The chief positions are *rampant,* erect on his hind legs; *passant,* walking; *couchant,* lying down with head erect; and *dormant,* asleep with his head resting on his fore paws.

The character of the lion has given rise to a number of proverbial expressions. Richard of England was called "The Lion Hearted." "The lion's share," has arisen from Aesop's fable of the lion who hunted with the fox and the wolf, claiming one-third of the game for his own share as a hunter, a second third by virtue of his kingship, and the last third on general principles. It will be remembered that Christian and Hopeful in *The Pilgrim's Progress* found lions in the way, typical of difficulties to be overcome. A person to whom high attention has been shown is said to be "lionized." To put one's "head into the lion's mouth" is to incur a great and needless danger.

The American "mountain" lion is merely the native panther or cougar. The name also appears in dandelion, ant-lion, and many other names of plants and animals.

See CAT; TIGER; UGANDA; LIVINGSTONE.

Lion of Lucerne. See THORWALDSEN.

Lippi, Filippo (1406-1469), an artist-monk who is also known by the Florentine variant of his name, Lippo Lippi. Fra Lippi is considered the first representative of the Florentine school of painters. He was among the first to represent the Madonna as a human and loving Florentine mother. In all his work is noted an excellent technique, warm, transparent color, and a boundless human sympathy. A story runs that the good monk was so fond of gaiety that it was his wont to neglect his easel and brushes, and that he had to be locked in his cell to insure his steady application. The finest of his extant works are the frescoes in the Cathedral of Prado which represent scenes from the lives of John the Baptist and St. Stephen; *The Coronation of the Virgin, Mary, Mother of Mercies; Madonna with Saints;* and *Virgin Adoring the Infant.*

Lippincott, Joshua Ballinger (1813-1886), the leading bookseller and publisher of Philadelphia. He was a native of New Jersey. In 1831 he established himself in the book trade in Philadelphia. In 1836 he founded the house of J. B. Lippincott and Company. *Lippincott's Magazine* was established in 1868.

Lippincott, Sara Jane Clarke (1823-1904), an American writer. She was born at Pompey, New York. In 1855, she married L. K. Lippincott of Philadelphia. She was for many years the editor of *"The Little Pilgrim,"* a juvenile paper. She was well known as a lecturer on anti-slavery and other reforms. She wrote for young people over the signature of "Grace Greenwood." Among her books best known by young readers are *Merrie England, Rec-*

ollections of My Childhood, and *Stories and Legends of Travel.*

Lipton, Sir Thomas Johnstone (1850-), a well known British merchant and sportsman, was born in Glasgow, Scotland, of Irish parents. After years of success as a retail merchant, Sir Thomas acquired extensive tea, coffee, rubber and cocoa plantations in Ceylon. The business was converted into a limited liability company in 1896, with Sir Thomas as chairman. He has interests in several business enterprises in the United States. Sir Thomas is the owner of the famous racing yachts, *Shamrock I, Shamrock II* and *Shamrock III,* with which he has unsuccessfully contended with American yachts for the American Cup, an international yachting trophy.

Liquid Air. See AIR.

Lisbon, liz'bon, the capital of Portugal. It lies on the northern bank of the Tagus, at the head of deep-water navigation, about nine miles from the Atlantic. It has a river frontage of four miles. It is situated in an amphitheater of low hills, at the foot of the lofty granite range of Cintra. The origin of the city is not known. It was occupied at an early date by the Romans. The Moors captured it in 716, and held it until 1147. The present Catholic cathedral and many of the churches and convents are ancient Moorish mosques or other buildings. In 1755 one of the most destructive earthquakes known visited the town. It overthrew many of the buildings and was followed by an ocean wave that destroyed 30,000 inhabitants.

Lisbon is distinguished for broad drives, promenades, and fine squares bordered by handsome houses and lines of shrubbery. The houses are chiefly of brick and stone, plastered on the outside with stucco and painted in delicate tints of red, blue, and yellow. These, and the gay clothing of the people, give the streets an appearance of a gala day. The botanic garden, public libraries containing half a million volumes, an observatory, a museum of antiquities, and an academy of sciences render the city an agreeable place of residence. There are squalid quarters as well. The city derives its supply of water from the mountains by means of an aqueduct. This aqueduct is partly underground, but, as it approaches the city, it crosses the vale of Alcantara by a bridge of thirty arches, the greatest of which is 240 feet high and 110 feet wide. It is the architectural feature of the city. About 6,000 vessels frequent the wharves of Lisbon annually. They bring tropical productions from the colonies of Portugal. Petroleum, hardware, machinery, foodstuffs, and cloth are imported. The principal exports are wine, salt, olive oil, fruit, and cork. The population of Lisbon, 1920, was 489,667.

See PORTUGAL.

Lisgar, Sir John Young, Baron (1807-1876), a British statesman and administrator, was born at Bombay, India, and educated at Eton and Oxford, England. He entered public life at an early age, for while still studying law he was elected to the British House of Commons, where he served continuously for twenty years. Sir John was appointed Chief Secretary for Ireland in 1852, and Lord High Commissioner of the Ionian Islands in 1855. Five years later he was appointed Governor of New South Wales. Previously to 1868 the Canadian Parliament had reduced the salary of the Governor-General, and several members of the Conservative cabinet in England had declined the position for that reason. But it was offered to Sir John and he accepted, and in 1869 was formally appointed Governor-General and governor of Prince Edward Island; he served until 1872. When Sir John took office the Riel, or Red River, Rebellion was in progress, but it was soon stifled. He was a capable administrator and won the good will of the greater part of the Canadian populace. Manitoba and British Columbia entered the Dominion during his administration, and the construction of the Canadian-Pacific Railroad was begun.

Lister, Joseph (1827-1912), an eminent English surgeon. He was born at Upton and was educated at London University. He was made a fellow of the Royal College of Surgeons. He held various lectureships and chairs in surgery at Glasgow, Edinburgh, and King's College, London. He

was made a baronet in 1883 and a peer in 1897. Sir Joseph Lister is one of the great names in surgical science. He took a leading part in the inauguration of the new science of antiseptic surgery. He taught that in surgery pus is neither laudable, necessary, nor permissible. See SURGERY.

Liszt, lĭst, **Franz** (1811-1886), a noted Hungarian musician. He was born at Odenburg and died at Baireuth. He attracted attention as a pianist when but nine years old. He was taken up by court circles and placed under the instruction of able musicians. At twelve he was the sensation of the day. His father accompanied him on a trip throughout the countries of western Europe. At thirteen he began the composing of operas. In 1831 he heard Paganini, to whom he became much attached. In his time Liszt was the most celebrated pianist in Europe. The musical centers of the world bid for him. He was received at the various courts and covered with decorations. The grand elector of Weimar, center of the little court at which Goethe resided for so many years, made him chapel master. Young men resorted to Weimar from all parts of Europe to be instructed by Liszt. Toward the end of his life he vibrated between Rome, Budapest, and Weimar. His home in the last named city has been converted into a Liszt museum, in which his decorations, musical instruments, and other personal mementos are preserved. His musical compositions and critical works are too numerous for mention here.

Litany, lĭt'a-ny, a solemn prayer of supplication, a responsive prayer used as a part of a service. In one sense of the word, any set prayer, as the Lord's Prayer, when used in a service, is a litany. Litanies form an important part of the services in the Greek, the English, and the Roman Catholic churches. The chief litanies of the last named are three, the Litany of the Saints, the Litany of the Blessed Virgin, and the Litany of the Most Holy Name of Jesus. See LITURGY.

Literature, in general, all recorded knowledge or thought. In a narrower sense, literature includes only that class of writings in which form and expression are essential features. A work must give expression to ideas of universal and permanent interest and must have literary "style," that is, beauty, power, and individuality of expression, before it may be literature.

To understand and appreciate fully the literature of any nation, the language must be understood. To translate a great work requires gifts on the part of the translator akin to those of the author. Translations are, however, of help in acquiring a general knowledge of the literatures of other countries. Some little idea of what various nations have produced in the way of literature is necessary for a well informed person. The following sketches are necessarily brief, and aim to give only the more important names and the more striking features in the development of the literature of each country.

Literature, American. American literature is divided for convenience into three periods: the Colonial period, the Revolutionary period, and the period of the Republic. As a matter of fact, all that precedes the nineteenth century must be looked upon as preparatory. A few names of importance appear, Benjamin Franklin's being the greatest. Cotton Mather and Jonathan Edwards were eminent divines who wrote on religious subjects. Barlow and Freneau were poets; Hamilton, Washington, and Jefferson may also be named as writers of influence. With the nineteenth century and Washington Irving, American literature really begins. James Fenimore Cooper produced the first novel and William Cullen Bryant is the first great poet. Halleck, Drake, and N. P. Willis are other poets who belong to this first group of American authors, sometimes classed as the Knickerbocker writers, because they all wrote for the *Knickerbocker Magazine.*

Two important movements began to influence the literature of America at about this time. The transcendental movement, affecting modes of thought, religion, and criticism; and the anti-slavery movement, striking deeper into the hearts and consciences of the people. The influence of these movements may be traced in both poetry and prose. Following Bryant, our first great poet, are the other New England poets, Longfellow, Lowell, Holmes, Whittier, and Emerson; the Southern poets, Poe and Lanier; and the Metropolitan writers,

so-called because they wrote from the great centers of life. Among these are Aldrich, Stedman, Gilder, Stoddard, Curtis, Warner, Whitman, Field, and others. Other poets whom it is difficult to classify are Riley, Edith Thomas, Joaquin Miller, and John James Piatt.

Among prose writers we find Emerson, Holmes, and Lowell as critics and essayists; Bancroft, Motley, and Prescott among historians; Phillips, Clay, Calhoun, Webster, and Lincoln as orators. Thoreau and Burroughs are the first of a long list who have produced nature studies of interest and literary merit. Humor, too, has been well represented by Mark Twain, Josh Billings, Charles Brown, and Petroleum V. Nasby. Since about 1870 the novel has been supreme in American literature. The interest in the reading and the writing of fiction has doubtless weakened literature so far as other lines are concerned. Soon after the Civil War the school of realism, as it is called, arose, with Howells and James as its founders. Toward the end of the century, Crawford, Mary Johnstone, Winston Churchill, and others led a reaction in favor of the romantic tale and the historical novel. The problem novel, too, has been produced, though it has not been as popular here as in England. A taste for the short story and the justification of such taste by the production of artistic examples, has been a recent feature in literature. Many names may be mentioned in this field. Mary Wilkins, Frank Stockton, Edward Everett Hale, and Margaret Deland are among the best short story writers. The reader is referred to separate articles on the individual authors mentioned in this article and on many other American writers whose names have been omitted necessarily from this sketch.

Literature, Arabian. During the Dark Ages, that period from the sixth to the eleventh century when European learning was almost extinct, literature in Arabia was developing in a manner which seems little short of marvelous. Two centuries before the time of Mahomet the Arabians had produced poetry of remarkable vigor and beauty. Their laws of meter and rhythm were simple, yet produced most artistic results. Poems of love and war, odes and songs, eulogies of distinguished men, elegies, and didactic poems are plentiful. Poetical contests were held at Mecca and at Okad, and every encouragement was given to the cultivation of the poetic art. The first prose of any importance is that of the Koran, but it is far inferior to Arabian poetry. It is irregular, possesses a sort of rhythm which seems unsuitable rather than pleasing, and is often ornate.

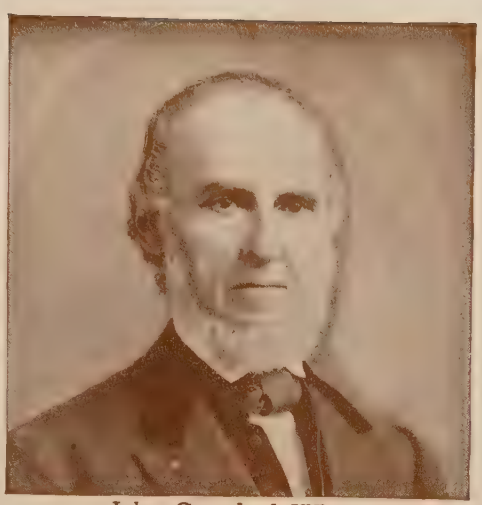
The eighth and ninth centuries were rather less favorable to poetry than those which preceded, owing to civil dissensions, but as the Arabians came into contact with Persia and Greece a new and brilliant school of poetry developed. In the eleventh century, through the intercourse which the Crusades established with the East, and that between the troubadours and the Moors in Spain, the learning which the Arabians had collected and cultivated began to affect the progress of literature in Europe. Mr. William Gifford Palgrave says:

> To the Arabians, directly and indirectly, we owe the revival of learning and philosophy in western Europe, and the first awakening of the critical and inquiring spirit that has in great measure rescued Europe from the lethargy of monkish ignorance and ecclesiastical bigotry; to them also, at least indirectly and by deduction, are due most of the useful arts and practical inventions laboriously perfected by later nations. Widespread as was the empire of the Arab sword, it has been less extended and less durable than the empire of the Arab mind.

Prose works were produced, however, modeled more or less closely after the style of the Koran. The Arabians delighted in romances and have many novels, often biographical in form. Their great work of fiction is *The Arabian Nights Entertainments* which is known the world over. History seems to be beyond the power of the Arab mind. For several centuries no literature worthy of note has been produced in Arabic.

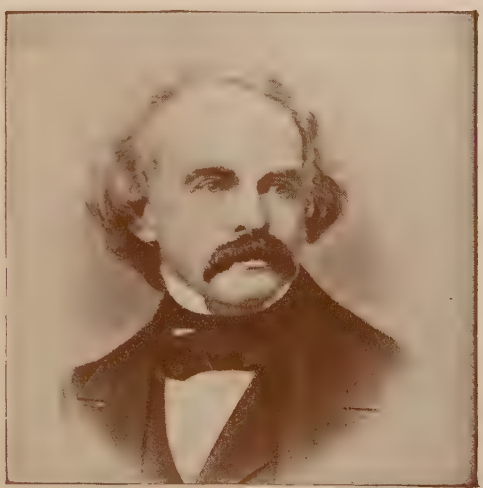
Literature, Babylonian and Assyrian. Since Babylonia and Assyria form geographically one country, their history has, naturally enough, been closely connected; and it is convenient to consider their literatures together, especially as the literature of both nations is preserved in the cuneiform inscriptions on tablets which took the place of books. As only comparatively few of these inscriptions have been translated, little is known of the literature of these countries

Henry Wadsworth Longfellow

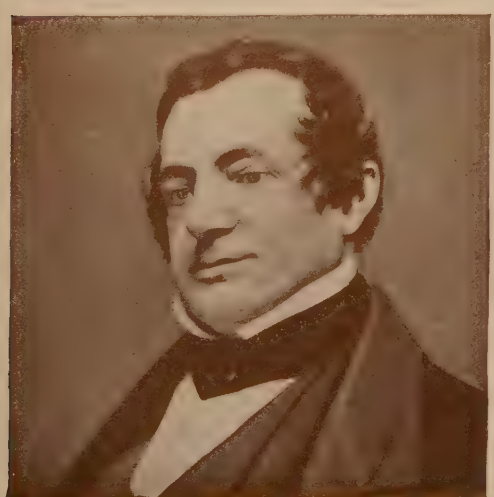


John Greenleaf Whittier

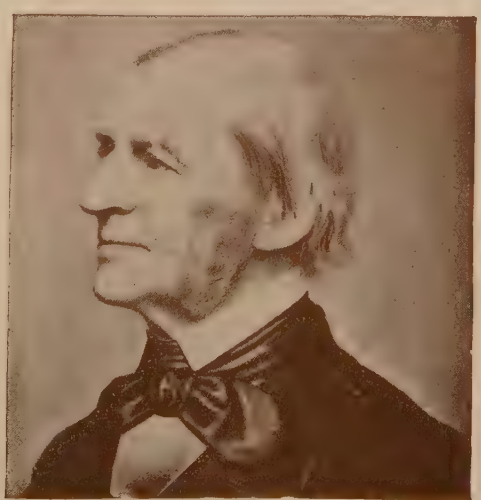
James Russell Lowell



Nathaniel Hawthorne



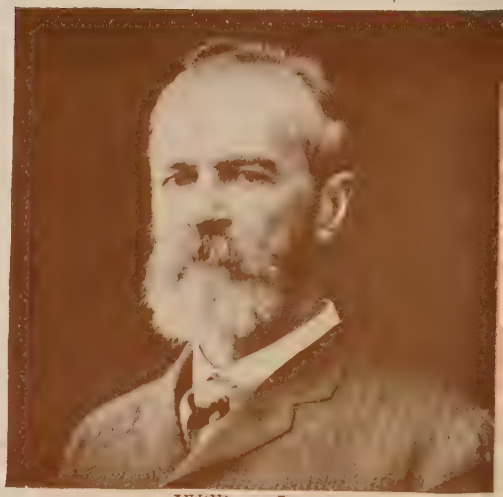
Washington Irving



Ralph Waldo Emerson

EARLIER AMERICAN WRITERS

Samuel Clemens (Mark Twain)



William James

Eugene Field

Richard Watson Gilder

William Dean Howells

Ida Tarbell

RECENT AMERICAN WRITERS

The Babylonians possessed, it is evident, a mass of legends concerning the centuries that elapsed before their genuine history begins. Astronomy seems to have been regarded as the subject of most importance. The chief astronomical work, called the *Illumination of Bel,* fills seventy tablets. It is almost entirely of an astrological nature, the astronomer's chief duties being the casting of horoscopes and foretelling the weather. Other tablets reveal hymns to the gods, some of them strikingly like the Hebrew, formulae for the use of magicians, and mythological poems. Of the latter *The Deluge* and *The Descent of Istar into Hades* may be mentioned. These two poems form part of the great Babylonian epic which is written in praise of the sun god. It consists of twelve books, each containing some legend appropriate to one of the signs of the zodiac.

The Assyrians were long content to translate Babylonian writings. When they began original work it was in imitation of that done by their neighbors. Their libraries were numerous, every large city possessing at least one. In the ruins of the Palace of Sardanapalus, who reigned 650 years before Christ, an enormous number of cuneiform tablets have been found. Some of these are very small, the inscriptions being in such fine characters as to necessitate the use of a microscope in deciphering them. Among them are epics, and chronological, historical, and legal works. The Assyrians possessed also grammars, rhetorics, and dictionaries, which have proved of great value in the study of comparative philology. The work of deciphering and translating the cuneiform inscriptions is necessarily slow. Scholars are engaged upon it continually, and in time the literature of these ancient nations will be available as a whole.

Literature, Canadian. Canadian Literature includes the works not only of authors born on Canadian soil, but also of British and French writers who have settled in Canada. The earliest literature consists of histories and discoveries. Among French writers in this line, Champlain and Charlevoix may be mentioned, and, among those who wrote in English, Hearne and Mackenzie. Down even to 1923 the greater part of Canadian literature was historical, descriptive and political, though a high type of imaginative literature was also produced. The best known Anglo-Canadian writers are C. G. D. Roberts, Bliss Carman, Archibald Lampman, Gilbert Parker, Theodore Haultain, Norman Duncan, Sarah Jeanette Duncan, Marjorie Pickthall, Stephen Leacock, Arthur Stringer and C. W. Gordon (Ralph Connor). There have been many notable French-Canadian authors, but they are not so well known as the Anglo-Canadians. Thomas Chapais, Louis Hemon and Laure Conan are among the better known French-Canadian authors. Hemon, however, was not a Canadian born Frenchman.

Literature, Chinese. The literature of China is the most voluminous and probably the most important of the literatures of Asia. It is also one of the oldest. In order to understand its characteristics, we must consider the vehicle of expression—the language. The Chinese language is monosyllabic and uninflectional. The position of a word in a sentence is all important. A noun changed to a different position may become a verb, or it may be altogether meaningless. With a language so incapable of variation, a literature can not be produced which possesses the qualities we look for and admire in literary works. Elegance, variety, beauty of imagery—these must all be lacking. A monotonous and wearisome language must give rise to a forced and formal literature lacking in originality and interesting in its subject matter only. Moreover, a conservative people like the Chinese, profoundly reverencing all that is old and formal, and hating innovation, must leave the impress of its own character upon its literature. In spite of these facts the Chinese are a literary and, we may say, a reading people. The only road to positions of honor is by way of competitive examinations open to all. This has tended to the diffusion of learning, and every professional man is able to read the books concerning his own profession at least.

The beginning of literature in China cannot be traced. There are allusions to early works which have been destroyed. There are nine canonical books, classed usually as the Five Classics and the Four Books.

1. Book of Changes or Transforma-

TIONS. This work is highly reverenced by the Chinese, but little understood. It dates from 1150 B. C. It consists of sixty-four essays, in which a system of philosophy is mystically set forth in diagrams and linear figures. It is used by hundreds of fortune tellers and soothsayers. Confucius endeavored with indifferent success to elucidate this book.

2. THE BOOK OF HISTORY consists of the records of dynasties from the twenty-fourth century B. C. to 721 B. C. They were compiled by Confucius from records which he found at the court of Chow. Mr. Wells Williams says that this book is the "foundation of the political system of the Chinese, of their history, and their religious rites,—the basis of their tactics, music, astronomy."

3. BOOK OF ODES. This book consists of songs and ballads. Some of them are so old that they belong to a time previous to any works of which we have knowledge. As in other countries, the first literature in China took the form of poetry. The empire was divided into a number of feudal states whose various princes met the king at stated intervals to receive orders. Ballads and songs were at these times presented to the sovereign. In the time of Confucius these songs numbered about 3,000. He selected some 300 of these and arranged them in the *Book of Odes.*

4. THE BOOK OF RITES. This has had an almost unlimited influence. Ceremony is most dear to the Chinese as individuals and as a race, and in the *Book of Rites* rules are laid down for the performance of every domestic duty, every social rite, every religious ceremony.

5. SPRING AND AUTUMN ANNALS. This is the only one of the classics which was actually written by Confucius. It consists of a long series of the briefest possible statements of facts and occurrences covering a period of 242 years.

6. THE FOUR BOOKS were written by the pupils and followers of Confucius. Mencius (371-288 B. C.), the sage's most noted disciple, was the author of one of them. His work is more original than that of Confucius himself. The teaching of the *Four Books* has been summed up in one sentence, "Walk in the trodden paths."

In 221 B. C. the emperor, Che-Hwang-tsi, ordered all books to be burned. In various ways copies of the classics were preserved. Portions of one of them were taken from the lips of a blind man who treasured them in his memory. The *Book of History* was found concealed in the wall of Confucius' house. Shortly after the death of this emperor paper was invented, and, about the close of the sixth century, the art of printing—nearly 900 years before it was known in Europe. Little printing was done for centuries, but gradually a literature grew up which, if not progressive, is at least voluminous. The catalog of the emperor's library consists of 122 volumes. Historical and geographical works abound and form the most interesting and valuable department of literature to all except the Chinese themselves. Encyclopedias and dictionaries are numerous and very complete.

Fiction, poetry, and the drama are all represented in Chinese literature. They are interesting as curiosities and as throwing light upon the customs and mode of thought of this people. From a literary point of view, they have little value. The present evidences of unrest in China and the opening up of the country to foreign influences must have its effect upon literature as upon all else connected with this strange, slow, conservative, and yet intelligent people.

Literature, Danish. The first Danish author of prominence is Arreboe (1587-1637), whose *World's First Week* displays learning and poetic beauty. Tycho Brahe of the same period performed a great service for science and literature. The first poet who belongs to the modern epoch is Evald (1743-1780). He produced poems beautiful in sentiment and artistic in form. He was also the author of *Balder's Death,* the first Danish tragedy, and of *The Fishermen,* a lyrical drama of power. By the beginning of the nineteenth century Germany was exerting a decided influence upon Danish literature, causing a new school of poets to appear. The greatest of this school is Oehlenschläger (1779-1856), who, besides poems, produced many romances. His chief work is *Gods of the North,* in which the legends of the Edda are united into one poem. Of all Den-

mark's writers Hans Christian Andersen is the best known to English and American readers. His stories have been translated into many languages.

Literature, Dutch. The little country of Holland was among the first to awaken from the lethargy of the Dark Ages. Three languages, the Dutch, Flemish, and Frisic —all of the Gothic family—were spoken. The Dutch became gradually the literary language of Holland. The earliest literature consisted of the lays of minstrels and the romances of chivalry. A translation of *Reynard The Fox* was made in the thirteenth century, and the Bible was translated into Flemish rhyme. Toward the close of the fourteenth century, a class of wandering minstrels, called "Sprekers," arose, who later organized literary societies called Chambers of Rhetoric. These societies were very popular. They held poetic contests, produced mystery plays, were prominent in national festivals, and cultivated the art of versification. However, as many of the Sprekers were illiterate, the influence upon the language and literature was not of the best.

In the fifteenth century a Dutch translation of the Bible was produced, but, except among the Sprekers, Latin remained the literary tongue in Holland as in other European countries. Didier, who took the Latin name of Erasmus, and Hugo de Grote, who took the name of Grotius, are the greatest writers of the fifteenth century. Anna Byns, called the Flemish Sappho, is the most important poet of this period.

In the seventeenth century three names are worthy of note. To Hooft, historian and writer of tragedy and of lyric poetry, is due credit for the development and perfecting of the language; Vondel, the greatest poet of his time, is called the Shakespeare of Holland; Jacob Cats, writer of didactic poems, is read widely in Holland and his works have their place beside the Dutch Bible. The last part of the seventeenth century witnessed a decline in literature which continued for a full century. During this period a few writers appeared, among them Poot, who is compared with Burns, and William Van Haren, author of *Friso,* the only strictly epic poem in the Dutch language. During the latter part of the eighteenth century, Madame Van Merken produced many long poems and tragedies, giving by her influence a new impulse to literature. Van Alphen, the Dutch poet beloved by children, belongs to this period.

With the overthrow of the Dutch Republic, literature, like everything else, was revolutionized. The early years of the nineteenth century were marked by translations from many languages, for a time almost eclipsing native talent. The greatest poet of Holland, however, appeared in the midst of these adverse influences. Bilderdyk (1756-1831) was not only a poet, but he was a profound scholar, a lawyer, a physician, an astronomer, and an engineer. His published works fill more than a hundred volumes, and his poem, *The Destruction of the Primitive World,* is one of Holland's glories. Feith was another poet of the nineteenth century, and Van der Palm was eminent as a writer of prose. The impulse which these three writers gave to Dutch literature is still felt, and, while no genius has arisen since, numerous authors of both prose and poetry have produced admirable work. Dutch literature has been enriched by translations from many ancient and modern languages.

The literature of the Netherlands, like the people, is earnest, religious, always simple, and often elevated and sublime. It is especially distinguished for its reflective and patriotic character, and bears the mark of that accurate study of the classic models which has formed the basis of the national education, and to which its purity of taste, naturalness, and simplicity are undoubtedly to be attributed. There exists no nation of equal population which, within the course of two or three centuries, has produced a greater number of eminent men.—Botta.

Literature, Egyptian. Egyptian literature consists wholly of inscriptions on monuments, and of manuscripts written on papyrus, found in mummy cases and in the ruins of temples. The discoveries of the last century have been extensive in this line, and scholars, by patient labor and skillful guessing, have interpreted many of these ancient works. To any except the enthusiastic Egyptologist, however, they are somewhat disappointing. They seem hardly more than a jumble of disjointed sentences arranged without regard for system. The inscriptions on monuments and

temples are quite uniform in character and devoid of interest except to the scholar. The papyri are of more importance. They are:

1. Religious Writings. Among these the *Ritual or Book of the Dead* is of first importance. Many copies of this book have been found in tombs. Evidently it was intended as a guide for the soul in its journey to the "Hall of Judgment." These manuscripts are beautiful in execution, but are full of discrepancies and errors of copyists. *The Book of the Lower Hemisphere* is of similar character. A few hymns have been found which display some little literary style.

2. Historical Writings. The histories are not of great value. They are devoted usually to the praises of some ruler.

3. Letters. Many of these are of great interest for the light they throw on Egyptian life.

4. Fiction. The two most important works are *The Tale of Two Brothers* and *The Romance of Setna.*

5. Biographical Sketches.

6. Epics. The epics are perhaps the most important of all from a literary point of view. There are two, *Pentaur* and *Mohan,* which have been called respectively the Egyptian *Iliad* and the Egyptian *Odyssey.*

7. Fables and Satirical Writings. In these all classes are caricatured, not even the kings escaping.

As to modern Egyptian literature, little can be said. An Arabic university at Cairo has been for many years the chief seat of learning. Numerous schools existed during the eighteenth century, but European domination has checked the diffusion of knowledge. Arabic is the literary language. Dialects have greatly affected the pure Arabic, however, and the language of newspapers and periodicals is a mixture by no means of a literary character.

Literature, English. An outline of the literature of England seems all that is necessary in this place, since all important names are considered in separate articles. The most natural classification divides the literature into three periods, in accordance with the three periods so significant in the development of the language. The periods of Old and of Middle English must be regarded as preparatory. Modern English literature may be subdivided in many ways. The classification used in this sketch seems the most natural and convenient. A brief characterization of the periods of modern English literature may be found useful.

The period of the Renaissance is marked by the revival of classical learning and by the development of English prose. The Elizabethan Age is the most brilliant in the literary history of England, and one of the most illustrious periods in all human history. Beginning with the first year of the reign of Elizabeth, different classifications terminate the period variously with the death of Elizabeth; with the death of James I; with the execution of Charles I, as is done in the following outline; or with the Restoration. The Puritan Age has been called the "Augustan Age of English divinity," from the fact that it is characterized by theological eloquence. It is sometimes called the Age of Milton. The period of the Restoration is characterized by the decline of the drama and by the influence of French style in composition. Dryden is supreme in prose and poetry. The Classical Age is marked by the supremacy of classical poetry, of which Pope is the great representative, and by the development of the essay and the rise of the novel. The Johnsonian Age takes its name from Dr. Johnson, who brings classical prose to its height. The last of the great dramatists appears. The rise of romantic poetry and the development of historical literature are other features. In the age of romanticism, romantic poetry is fully developed, while classicism is abandoned. The romantic novel and the rise of journalism are to be noted. The Victorian Age is the age of progress. The development of the natural sciences, the spread of general knowledge, and the advance of democracy are the chief forces at work. The novel is supreme in literature. Artistic poetry and polished essays are produced. Criticism and history occupy important places. English literature exceeds all others in volume. A few of the most important writers are as follows:

I. Old English Literature (-1200).

Beowulf.
Caedmon's Paraphrase of the Psalms.
King Alfred.
The Saxon Chronicle.
The Venerable Bede.

II. Middle English Literature (1200-1485).

Layamon.
Orm, *or* Ormin.
Geoffrey Chaucer.
William Langlande.
John Gower.
Thomas Occleve.
John Lydgate.
James I of Scotland.
Old Ballads.
Sir John Mandeville.
John Wycliffe.
William Caxton.
Paston Letters.

III. Modern English Literature (1485-).

A. Period of the Renaissance (1485-1558).

Sir Thomas More.
Skelton.
Howard (Earl of Surrey).
Wyatt.
Udall.

B. Elizabethan Age (1558-1649).

Spenser.
Bacon.
Raleigh.
Sidney.
Marlowe.
Shakespeare.
Beaumont.
Fletcher.
Ben Jonson.
Massinger.
Ford.
Herbert.
Herrick.

C. Puritan Age (1649-1660).

Milton.
Burton.
Taylor.
Walton.
Cowley.
Bunyan.

D. Period of the Restoration (1660-1700).

Dryden.
Butler.

E. Classical Age (1700-1745).

Defoe.
Swift.
Pope.
Addison.
Steele.
Richardson.
Fielding.
Sterne.
Smollett.

F. Johnsonian Age (1745-1784).

Johnson
Hume.
Gibbon.
Hallam.
Burke.
Goldsmith.

G. Age of Romanticism (1784-1837).

Cowper.
Burns.
Byron.
Coleridge.
Southey.
Wordsworth.
Campbell.
Moore.
Scott.
Shelley.
Keats.
Lamb.
De Quincey.

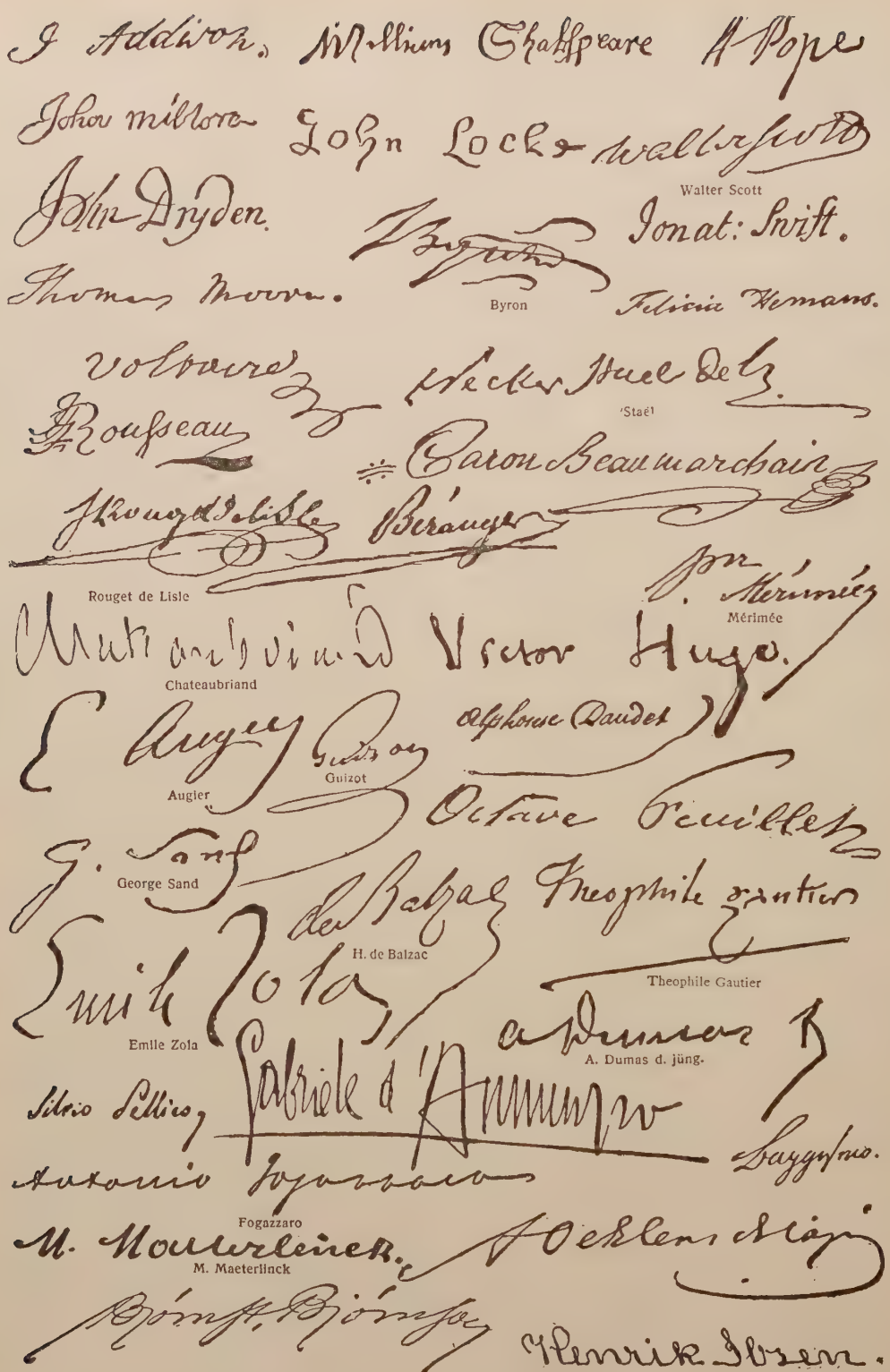
H. Victorian Age.

Thackeray.
Dickens.
Brontë.
Lytton.
Kingsley.
Eliot.
Macaulay.
Carlyle.
Morley.
Arnold.
Ruskin.
Darwin.
Huxley.
Spencer.
Browning, Robert.
Browning, Mrs.
Tennyson.

Literature, Finnish. The *Kalevala* is the great monument of Finnish literature. The poem is a national epic or folk epic. Elias Löunrot in the nineteenth century wandered through the country and took down from the lips of peasants the old popular songs, arranging and systematizing them into a single complete poem. The story is of the heroes of Kalevala, the land of happiness, and their contest with other heroes from the cold north and the land of death. The poem consists in its final edition of 22,793 lines in fifty cantos. The meter is trochaic tetrameter, the same we find in Longfellow's *Hiawatha.* The *Kalevala* has been translated into English by J. M. Crawford. During the nineteenth century the Finnish people have displayed considerable literary activity. Works on history and geography have been produced, as well as religious and moral treatises. A number of poets have written popular verses. Translations have also been made from Swedish literature.

Literature, French. Up to the year 1500 French literature consists chiefly of the poems of the trouvères and the troubadours, to which separate articles are given. We find the beginnings of French prose in the chronicles of this period, those of Froissart being the most important. The period of the Renaissance and Reformation is the Golden Age of French literature. The chief influences at work were ancient learning, religion, and the monarchy of Louis XIV. Rabelais, a learned scholar, but the "great jester of France," as Lord Bacon calls him, may be regarded as typical of the Renaissance; Calvin, of the Reformation. The intellectual awakening aroused in France a spirit of inquiry which soon led to skepticism.

Montaigne stands foremost among the skeptics and is of note as the earliest phil-



AUTOGRAPHS OF FAMOUS PEOPLE

osophical writer, while Descartes is another name prominent in the line of philosophical inquiry. The sixteenth century presents the names of Ronsard and Malherbe in poetry, and of J. de Balzac in prose, whose writings exemplify the light literature of this period. In the seventeenth century dramatic literature becomes of first importance, with the great names of Corneille, Molière, and Racine. La Fontaine stands high as a writer of narrative poetry; Boileau wrote satires; Fénelon and Madame de La Fayette, romances; Rochefoucauld, moral philosophy; and Madame de Sévigné is noted for her brilliant letters.

The third period of French literature covers the time from the beginning of the eighteenth century to the present. It is marked by skepticism, a taste for the modern in literature, and political unrest, culminating in the French Revolution. The dominant influence during the first part of the period was the spirit of skepticism. Montesquieu, Voltaire, Rousseau, and Buffon are the four noted writers of this time. During the Revolutionary period, we find in literature the names of Bernardin St. Pierre, Madame de Staël, and Chateaubriand. Since the close of the Revolution France has produced writers in every department of literature. The greatest name is perhaps that of Victor Hugo, who excelled in poetry, drama, and as a novelist. Dumas, father and son, and Sardou are other well known dramatists.

In fiction Hugo, Dumas, Honoré de Balzac, George Sand, Sandeau, and others appear to have taken as a model the novels of Sir Walter Scott. This group has been followed by many later writers of almost equal excellence. A few poets have appeared also, as well as historians, critics, and miscellaneous writers; but drama and fiction are the lines in which the French genius of the nineteenth century has expressed itself. The chief characteristics of French literature are invention, lightness and delicacy of touch, and clearness of style. Goethe says:

> The French do not deny their general character in their style. They are of a social nature, and so never forget the public they address; they try to be clear to convince the reader, and charming to please him.

Literature, German. German poetry has had two periods in which it has attained special excellence. The first extends from the beginning of the twelfth century to the middle of the thirteenth. The other from the middle of the eighteenth through the first quarter of the nineteenth. To the first of these periods belong the famous *Nibelungen Lied* — the great folk-epic of Germany—the epic of *Gudrun,* and the songs of the Minnesingers. The songs and ballads composing the *Nibelungen Lied* belong to a much earlier period, but were first collected and arranged in definite form during the twelfth century. Beside the *Nibelungen Lied,* only one poem, a fragment of a heroic song, called *Hildebrand's Lied,* has come down to us from earlier times. By the middle of the thirteenth century, the poetry of the Minnesingers began to decline. By almost imperceptible gradations, it shades into the more formal, but less beautiful, poetry of the Meistersingers, which reached its height in the fifteenth and sixteenth centuries. The development of the drama began as early as the thirteenth century with the mysteries and miracle plays so popular throughout Europe. The important work in prose up to the time of Luther was done by monks, among whom the names of Tauler and Thomas à Kempis are to be noted.

The foundation of universities and the invention of printing prepared the way for the German Reformation, which, with Martin Luther and his translation of the Bible, marks the beginning of what may be called the second period of German literature. Next to Luther himself, Melanchthon had, probably, the greatest influence upon the literature of this time. In poetry the name of Hans Sachs is prominent, but the best poetry of the period is found in the hymns of Luther and others which, through the influence of the great reformer, came into daily use among the people. Paul Fleming is another name worthy of note as a poet of this period. He wrote hymns notable for sincerity of feeling and simplicity of style.

The third period of German literature begins with the beginning of the eighteenth century and includes, with the exception of Luther, the names of the most famous men of the nation. The departments in

which the greatest excellence has been attained are philosophy, the drama, and poetry. Separate articles are given to the philosophers, Kant, Fichte, Schopenhauer, Hegel, Schelling; to the great dramatists, Schiller, Lessing and Goethe; and to the more important among the other poets. Schiller and Goethe are the greatest names among poets. Heine is noted especially for his lyrics; Klopstock for his epic, the *Messias;* Wieland, Herder, the Schlegels, Arndt, Jean Paul, and Uhland are also important in this second "period of bloom" of German poetry. Goethe, Schiller, and Lessing wrote prose as well as poetry. Lessing, Gottsched, and the Schlegels were influential as critics. In the line of fiction, of history, and in miscellaneous writings, long lists of names appear which go to make up a literature which does not fall short when ranked with the greatest in the world.

Literature, Grecian. The literature of Greece has had doubtless a greater and more far-reaching—a more pervasive—influence than that of any other nation. Little more than a characterization of the various periods is attempted in this article. The development of various forms of literature in Greece is discussed under the headings, EPIC, DRAMA, TRAGEDY, COMEDY, etc., and separate articles are given to all important literary characters. The history of ancient Greek literature is divided into three periods:

I. From the earliest times to the age of Herodotus (484 B. C.). This period is marked by ballad poetry and the development of the epic, and by the greatest examples of lyric poetry and by the beginnings of philosophy. The earliest lyrics are the song of Linus, sung at the grape-picking, and the song of Bormus, sung at the corncutting. Both are songs of mourning for beautiful youths cut down by untimely death and are evidently symbolic. Sappho's songs, including the lament for Adonis; the Paeans, songs to Apollo; the ballads of the Rhapsodes; the poems of Homer and Hesiod; and, in the latter part of the period, the elegies of Solon and Simonides, and the varied writings of Pindar. The poems of Anacreon, Arion, and Ibycus belong here. The chief exponents of philosophy are the Seven Sages. Anaxagoras and Pythagoras are other names of importance. The fables of Aesop are perhaps the most important prose of this time.

II. The second period embraces the time when Athens was at the height of her glory; it is the most brilliant period of Greek literature. The development of history, the drama, and of oratory mark this epoch, which closes with the downfall of Athens. Herodotus is the first and most important writer of history. Thucydides is also a noted historian. In dramatic poetry we find three great names,—Aeschylus, Sophocles, Euripides. Aristophanes, writer of comedy, should be mentioned. Public speaking was cultivated at Athens, especially during the age of Pericles, who was himself an orator, although his speeches have not been preserved. Other important names in the line of oratory and philosophy are Demosthenes, Aeschines, Socrates, Plato, and Aristotle.

III. The third period in Greek literature is the period of decline. It covers the time from the death of Alexander the Great, 323 B. C., to the fall of Constantinople. The seat of learning was no longer at Athens, but at Alexandria, and gradually both language and literature declined. The bucolic poets are the most important writers of this period. Theocritus is first among them. Alexandria produced many scholars and scientific discoverers. We may also mention the famous Alexandrian Library of 700,000 volumes in various languages, but especially in Greek. Philosophy still flourished at Athens. After Greece came under Roman rule many Greek writers published their works in Rome and Roman writers took the ancient Greeks as their models.

After the fall of Constantinople Greek literature came to a standstill so far as productiveness was concerned. The Greeks, however, were prominent in helping to spread a knowledge of their language through Europe. The eighteenth century witnessed a revival of enthusiasm for learning and literature. It is said that at present no nation produces so much literature in proportion to its numbers as does Greece. Prose of every kind is produced, many women being particularly successful in this line. In poetry, three names are promi-

GREEK WRITERS AND THINKERS

Homer
Aeschylus
Herodotus

Sophocles

Plato
Socrates
Thucydides

nent: that of Panagitos Santsos in lyric poetry, of Alexander Santsos in satire, and of Alexander Rangabe, who has produced both poetry and prose of great excellence.

Literature, Icelandic. The ancient literature of Scandinavia in the Old Norse tongue has been preserved in Iceland. It consists of the *Eddas,* the *Sagas,* and the poems of the Skalds. It is discussed in separate articles under these three heads. The systematizing of these remains is due to the intelligent and painstaking labor of Icelandic scholars. No modern Icelandic works can compare in interest with these ancient writings. However, the people of Iceland are intelligent and progressive, and since the middle of the eighteenth century work has been done by them in nearly every department of literature. The most important works of European nations have been translated into the Icelandic tongue.

Literature, Italian. In Italy during the first part of the Middle Ages various dialects were spoken, but Latin was still the literary language, and the influence of Roman culture and Roman love of freedom was active in the minds of Italians. When other European nations were interested in the romances of chivalry the Italians were studying Roman law and history and Greek philosophy. Toward the close of the thirteenth century the Tuscan dialect having become well established, the Tuscan school of lyric poetry arose,—the true beginning of Italian literature. Dante is the most noted poet of this school, to which he belongs as author of the *Vita Nuova;* although not lyric, but epic, was the form of Dante's greatest work. Petrarch, famous for his sonnets, is the second great poet of this period. Prose is exemplified by Boccaccio in the *Decameron.* All three of these great writers were Florentines; for the Arno and Florence hold much the same relation to Italian literature as the Thames and London hold to English literature. Petrarch and Boccaccio were ardent students of the ancients, and Petrarch believed his works in Latin to be far superior to his sonnets. The attention paid to the dead languages was a serious hindrance to the development of literature at this time, and was perhaps responsible for the fact that, during the latter part of the fourteenth and nearly the whole of the fifteenth century, literature was at a standstill.

The next step in the development of Italian literature was made by Lorenzo de Medici (1448-1492), who, himself a poet, gathered a brilliant circle about him and opened a new era in Italian poetry. Perhaps the most gifted individual of Lorenzo's circle was Poliziano, who not only wrote lyrics, but revived on the stage the tragedies of the ancients and composed and presented *Orpheus,* the first Italian dramatic production. The next name of importance is Ariosto, author of *Orlando Furioso,* a metrical romance in forty cantos. Tasso's epic poem, *Jerusalem Delivered,* another great work, celebrates the events of the First Crusade.

Pastoral dramas, didactic poetry, satires, novels, tales, histories, and philosophy all appeared during the sixteenth century. Machiavelli was one of the first novelists. He wrote also histories and discourses on various subjects. The seventeenth century marks a second period of decline in Italian literature. Many dramatic authors appeared, though few of them equaled those of the preceding age. Histories, too, are plentiful, but do not possess any noticeable degree of merit. In the eighteenth century again followed a revival and evidence of an improved literary taste, the first result of which was seen in the theater. The Italian opera or melodrama met with great success. In comedy, Goldoni wrought almost a revolution. Tragedy, too, reached a high standard under the hand of Alfieri, who revived the national character of dramatic productions. *Saul* is his masterpiece. The novel developed slowly. Not until the nineteenth century was any fiction of merit produced. Little advance has been made in literature since the middle of the nineteenth century. The present tendency in poetry is toward realism. Drama and fiction, history and travel, have all received attention, but few names appear which are of importance.

Literature, Japanese. In considering the literature of Japan, the first thing noticeable is the difference between the spoken and written language. In ancient times —that is, during the first centuries when a written language existed—the two were

identical. But the literature of China, which was widely studied in court circles of Japan, exerted a marked influence. Chinese words were introduced and native productions were written in the Chinese language. The result was that the written language came to consist of characters borrowed from the Chinese, supplemented to a greater or less extent by a native alphabet consisting of forty-seven indivisible syllables. An effort is being made to do away with the Chinese characters and thus make the spoken and written languages again identical. The Japanese have produced all forms of literature. The classes in which they have done the most important work are those of history, geography, poetry, drama, and fiction. Up to the fourteenth century literature was confined wholly to the court circle. *Kojiki,* a book of historical traditions and mythology dating from the eighth century, and *Nihonghi,* of a little later date, are the oldest novels extant. The fourteenth, fifteenth, and sixteenth centuries may be looked upon as Japan's dark ages. Learning was kept alive by a few priests only. The seventeenth century marks the beginning of the modern period. As a nation the Japanese are careful to make and preserve records. Of later historical works, *The History of Great Japan,* composed in the seventeenth century, is the standard. Japanese fiction is more imaginative and more true to nature than that of other oriental nations. It is an interesting fact that the best literary work of the best ages has been done by women. The people are fond of reading and especially of poetry. In the last century an immense number of books has been published, including many old manuscripts which have appeared in modern form.

Literature, Jewish. The ancient literature of the Jews is found in the books of the Old Testament and in what are called the rabbinical writings. Written in the Hebrew language, the Old Testament has been translated into every known tongue and has had a greater influence than that of any other book. Monotheism, the worship of one supreme being, is the fundamental idea of Hebrew literature. The first five books, called commonly the Pentateuch, include the accounts of the origin of the world and the history of the beginning of Israel as a nation and its establishment in the Holy Land. The historical books include also Joshua, Judges, Samuel, Kings, Chronicles, Ezra, Nehemiah. The prophetic books are usually classified as the Greater Prophets, including Isaiah, Jeremiah, to whom is credited the book called by his name and the book of Lamentations, Ezekiel and Daniel, and the Lesser Prophets, including Hosea, Joel, Amos, Obadiah, Jonah, Micah, Nahum, Habakkuk, Zephaniah, Haggai, Zechariah, and Malachi. The poetical books include the Proverbs of Solomon and Ecclesiastes, which are didactic, the book of Job, which is largely dramatic, the Song of Solomon, a collection of love songs, the pastoral poem of Ruth, the book of Esther, and above all the Psalms of David. Poetry, especially lyrics, are found in many of the historical and prophetic books. Moses' hymn after the crossing of the Red Sea and the elegies of Lamentations are instances. Rabbinical literature includes the writings of the rabbis or teachers of the Jews in the later period. The Talmud is a collection of traditions illustrating laws and usages. The most brilliant period of modern Jewish literature is that of Moorish Spain. Here the Jews cultivated science and literature. Astronomy, history, poetry, music, philosophy,—all received attention, and in all the Spanish Jews excelled. Later, in many different countries, Jews have shown intellectual superiority, especially in Germany, where Moses Mendelssohn became distinguished as a philosopher, Heine as a poet, and Auerbach as a novelist. The two Disraelis and Zangwill in England and Emma Lazarus in America are also well known Jewish writers.

Literature, Norwegian. The statement has been made frequently that Norway had no national literature until the nineteenth century. While quite true this statement is somewhat misleading. It must be borne in mind that the beginning of Norwegian,—that is the Old Norse,—literature was preserved in the *Eddas* of Iceland and belong, therefore, to Icelandic literature; and that for more than four centuries the history of Denmark and Norway was one, and the productions of Nor-

wegian writers of that time belong to Danish literature. Moreover, Norway's remarkable progress in the field of literature during the one century since her separation from Denmark entitles her not only to rank with the other Scandinavian nations but with the foremost literary nations of the world.

The earliest songs of Norwegian authorship found in the *Eddas* were probably composed during the ninth century, and settled in the memories of Norwegian skalds or singers. It is probable that several hundred years elapsed before they were committed to writing.

Norway contributed also to the Old Norse prose literature of the thirteenth century. *Thidrekssaga,* the story of Dietrich of Bern, written about 1250, *Karlamagnussaga,* the story of Charlemagne, and *Balaamssaga ok Josaphats* are by Norwegian authors.

Of those Norwegians whose names are famous in Danish literature, Pedar Dass (1647-1708), whose poems are still favorites, is first in importance. Others are Ludvig Holberg Tullin, the poet of nature, and Brin, the author of the first Danish tragedy. During the eighteenth century many poets appeared, Edward Storm being the most important, who began to show signs of national spirit. A few songs and ballads were produced in the Norwegian dialect.

In 1814, with the separation from Denmark, Norwegian literature as a distinct product of national conditions began. For twenty years or more its poetry was patriotic to the point of vehemence, this patriotism showing itself largely in adulations of the beauties of Norway. Henrik Wergeland, whose first lyrics were published in 1829, is the first great poet, although less pronounced in his patriotic fervor than some of his contemporaries. Wergeland objected decidedly to foreign standards in poetry and carried on a long and violent controversy with another poet, Welhaven, who, however, was successful ultimately in revolutionizing the esthetic taste of Norway. Welhaven's critical writings are among the best Norway has produced.

Two writers, Asbjörnsen, and Jörgen Moe are responsible in great measure for introducing Norwegian folklore into the field of literature. This not only gave a new direction to subsequent writers but was effective in helping to develop a national literature.

A national language seems essential to a national literature. Between 1860 and 1870 a remodeling of the Norwegian language took place, and according to Björnson modern Norwegian literature began. The Danish language proved inadequate for the national spirit and to quote Björnson, "it was bent and burst through like an old river bed by a new flood." Old Norwegian words from the dialect of the common people were introduced in great numbers, sentences grew shorter and more forcible, the language as a whole grew sweeter and stronger. Longing to throw off all Danish influence Ivar Aasen advocated the use of the original Norwegian dialect before it had been affected by the Danish. He called it the Landsmaal, or national tongue, and found many supporters for its use in literature. The Dano-Norwegian, however, has been the language of the greatest of Norway's writers, Ibsen and Björnson. These two authors are discussed in separate articles, as also are Boyeson, Jonas Lie, and Wergeland.

After these great names the most important is that of Elexander Kjelland, writer of novels and short stories. Camilla Collet, novelist, sister of the poet Wergeland, and Anna Magdalena Thorsen may be mentioned among woman writers. Norway boasts several prominent historians; Rudolph Keyser, Peter Munch, and John Ernst Sars are among them.

Björnson states that the distinguishing feature of Norwegian literature is the evidence of a feeling of wholesome responsibility; "In the whole Norwegian literature-fleet, there is not one pleasure craft."

Literature, Persian. Persia has had three periods of intellectual prosperity when literature has advanced with rapidity and brilliancy, only to die out again under the stress of changing political conditions.

1. Ancient Persian literature, or the literature of the Zendic period as it may be called, includes the sacred writings of Persia, the *Zendavesta,* dating from about the sixth century B. C. This work contains

the doctrines of Zoroaster. Ancient inscriptions, comprising some thousand lines of cuneiform texts carved on the great rock at Behistun or on tablets, belong to this period. The inscription at Behistun tells of Darius, the king, and the greatness of his empire. Doubtless songs and mythological stories and perhaps chronicles existed at this time, but of such no record remains. The literature of this period was destroyed or scattered at the time of Alexander's conquest.

2. The second period of Persian literature is called the Pahlavi period, from the dialect spoken at that time. It is also known as middle Persian literature. Under the Sásánian kings of the third century, the remnants of the *Zendavesta* were collected and systematized, and many new works, all of a religious character and filled with the spirit of Zoroastrianism, were produced. This was in turn checked and well nigh destroyed by the Arabian invasion of the seventh century.

3. Modern Persian literature took its rise in the latter part of the ninth century. Poetry is the most important department of this period, the rich Persian tongue seeming to be unusually adaptable to this form of composition. Even sciences—grammar, natural history, medicine—are all expounded in verse. The earliest poet of note is Ferdusi, author of the *Shah Nameh*. Omar Khayyam, called the "King of the Wise," lived in the eleventh century. He denounced intolerance and hypocrisy. Hafiz of the fourteenth century is the greatest of Persian lyric poets. His poems display great variety and are full of grace and beauty. These are the greatest names of the greatest period of Persian literature.

The Persians possess works on history,—philosophy, geography, rhetoric, mathematics, and astronomy. Celebrated works of modern European nations have been translated into the Persian language. The ideal book in Persia is still a manuscript, written beautifully on fine, silky paper with illuminated margins. Such books are often powdered with gold dust and perfumed with costly essence. In the nineteenth century the drama began to attract attention in connection with the Mohammedan religion. The national play of *Tazieh,* corresponding to the Passion Play in many respects, is presented regularly. Several poets of the nineteenth century have shown such marked merit that it has been prophesied that another period of revival, and perhaps of brilliancy, is yet to come to the land of Persia.

Literature, Portuguese. The earliest monuments of Portuguese literature are ballads, after the Provençal fashion. They were doubtless sung by wandering minstrels, and owe their origin to the French knights who founded the political independence of Portugal. The last part of the fifteenth and the beginning of the sixteenth century may be called the golden age of Portuguese poetry, though not until 1524 did a poet appear whose name attained celebrity outside of the peninsula. This was Luis de Camoëns (1524-1579). His epic poem, the *Lusiad,* constitutes the great claim of Portugal to a literature.

Literature, Roman. While Greece gives us the most important literature of antiquity, that of Rome is closely associated with it and stands second in the influence it has exerted. The Romans were a nation of physical rather than intellectual energy. They were less imaginative, less refined, than their Greek neighbors; we find, therefore, that literature is of later development among them and of a somewhat different character. Roman literature may be divided into three periods; first, that of its beginning and early development; second, that of its greatest power; and third, that of its decline.

1. The first period includes the time from the First Punic War to the Age of Cicero (241-74 B. C.). The Romans, like other nations, possessed songs and poetical compositions preserved by oral tradition. The first written literature, however, was in the form of history—a simple record of events without literary qualities of any sort. The poets of this period who attained any degree of excellence are few. Livius, Andronicus, and Naevius made translations from the Greek. Ennius wrote an epic, the *Annals.* Plautus and Terence were writers of comedy in imitation of Greek comedy. Prose seems to have been much more in accord with the Roman temperament than poetry. Fabius Pictor (219 B. C.) is the first historian of note. His subjects were the First

ROMAN WRITERS AND THINKERS

Horace
Livy
Lucretius

Marcus Aurelius

Tacitus
Virgil
Seneca

and Second Punic Wars. The *Origines* of Cato was a complete history of Rome and Italy up to and including his own times. Only fragments of this work remain. Ninety of Cato's *Orations* are preserved.

2. The second period covers the Age of Augustus, and to it belong the most illustrious names of Roman literature. The period is sometimes known as the Age of Cicero, named for Rome's greatest orator, whose orations are still regarded as models of Latin prose. As the historians of this period, appear the names of Caesar and of Sallust, of Livy, of Dionysius, and of Diodorus. The three great Roman poets are Horace, Virgil, and Ovid. Others are Lucretius, the Epicurean, and Catullus, the writer of lyric poetry.

3. With the death of Augustus the decline of literature began. A few names only are of importance. Plutarch, the author of the famous *Lives* of celebrated Greeks and Romans, which has been called a textbook of heroism; Tacitus, the historian; and Pliny, the scientist, belong to this period. Among philosophers are Epictetus, Seneca, and Marcus Aurelius. The reader is referred to articles on all important names mentioned in connection with Roman literature.

Literature, Russian. The earliest Russian writers were ecclesiastics, the most noted of whom is the monk, Nestor. He produced the first Russian chronicle in the twelfth century. At this time traditions and folk-lore, some specimens of which have been preserved, existed to quite an extent. The Mongol invasion put a check upon national life and literature, the books of the church were revised by Nihon, and numerous sects sprang up through the country. Shortly foreign influences began to be felt, many scholars and writers establishing themselves in Moscow. Many translations of foreign works were made, and lyric poetry and satire appeared in the Russian tongue. Lomonosoff (1712-65) is called the father of Russian literature. His influence in establishing the language, in laying down principles of grammar, and in giving form to the national poetry was of the highest importance. Sumarakoff (1718-99) produced dramas and established the *Busy Bee,* the earliest periodical. Toward the end of the eighteenth century French influence, which had been paramount, began to give way to that of Germany and England. Novels of middle class life became popular. Karamsin was a writer of novels and also produced a *History of Russia,* of important influence in the development of a pure and simple prose style. Alexander Pushkin (1799-1837) is the greatest of Russian poets. Influenced by foreign poets, he was still altogether Russian and, with a remarkable mastery of form, attained in poetry an excellence which makes his work the model of Russian poets. Since 1825 a vast number of writers have appeared of sufficient importance to give Russian literature a position in the front ranks of European national literature. Gogol represents naturalism in fiction. Turgenyeff and Tolstoi are great names of the present period.

Literature, Spanish. The earliest literary work of Spain is the Poem of the *Cid* of the twelfth century. Following this, although somewhat later, the literature of Spain falls into two classes: that produced in court circles, usually poetry of the troubadour style; and what may be called the popular literature. The latter is of more interest than the former. Popular literature up to the middle of the sixteenth century consists of ballads, the lyrical and narrative poetry of the common people; chronicles, comprising *The Chronicle of Spain* and various records of persons and events; romances of chivalry; and dramas, that is, mysteries and miracle plays. About the middle of the sixteenth century, the mysteries, heretofore the only dramatic production, began to decline, and a form of drama arose, more original and more purely national than that of any other European nation except England. The names that are prominent in connection with Spanish drama are *Lope de Rueda, Lope de Vega,* and *Calderon.* In fiction we need mention only Cervantes, by far the greatest name in Spanish literature. Spanish literature in the eighteenth and nineteenth centuries has been greatly influenced by the French. Many writers have appeared but little of importance has been produced.

Literature, Swedish. The oldest remains of Swedish literature are in the form

of Runes, indicating that legends and folk tales were common. With the introduction of Christianity the clergy became the important factor and their works follow Latin models. During the period of the Reformation a translation of the Bible was made and mystery plays appeared in Sweden as elsewhere. Messenius attempted to substitute history for legend in these plays, his efforts marking the first development in the drama. The greatest name of the period is that of Sternhjelm, who produced odes, lyrics, and didactic poetry. During the eighteenth century, French taste prevailed and French models were imitated in Sweden as elsewhere in Europe. Gustavus III, as a master of rhetoric; Dalin, who is likened to Addison; Kellgren, the lyric poet; and Leopold, the dramatist, are the most notable names of this period of formalism and slavish imitation. With the second decade of the nineteenth century, a new era dawned. Romanticism represents the reaction from French theories. The phosphorists were a school of writers representing the extreme of romanticism. In opposition to the Romanticists arose the Gothic school aiming at a national literature. To this school belong the most famous poets of Swedish literature—Geijer, Tegner, Runeberg. Fiction now received attention. Frederika Bremer and Cederborg are prominent names in this line. In the later part of the century nearly every department of literature had its able representatives.

Lithium, a metal discovered in 1817. It exists in tourmaline, meteoric stones, mineral waters, coffee, tea, milk, and blood. It is the lightest known solid, being little more than half as heavy as water. It has a bright, silvery, metallic lustre, and melts at 356° F. It resembles potassium in many respects. It can be drawn into a wire and may be welded without heat. Like lead, it may be cut readily with a knife. When burned in oxygen it emits a brilliant red color. Compounds of lithium are used in fireworks on account of the brilliancy they impart to the flame. Its compound with oxygen is called lithia. The latter is a well known ingredient in many mineral waters. The compound known as lithia was discovered in 1817, but the metal was not separated until Bunsen studied its properties in 1855.

Lithography, li-thŏg′-ra-fy, originally the art of preparing a stone surface for printing and of printing from it. The larger part of modern lithography is done with sheet zinc, although aluminum is sometimes used.

The art of lithographing was suggested by a German named Senefelder, who sought some means of improving etching and copper engraving. He hit upon the idea of printing from stone about the year 1796. In 1806 he settled at Munich, a city which is still noted among lithographers.

The best lithographers' stone is quarried near Solenhofen, Bavaria. It varies in color from a light cream to a blue-gray. Stone of somewhat inferior quality is found in France and England. In the United States small deposits have been found in Texas, Virginia, Indiana, Arkansas and Iowa but as a rule the American stone is so inferior that only small sections can be used.

Whether a desired lithograph is to be produced from stone, zinc or other surfaces the surface must be polished to a perfect plane and be free from imperfections of all kinds. The design may be traced upon the surface with a crayon composed of beeswax, tallow, shellac, mastic, turpentine, soap, and lampblack. The sketched surface is then treated with a solution of gum arabic and nitric acid which acts chemically on the uncovered portion of the surface and forms a water-like film which rejects grease. The ink used in lithographing contains grease and when a sheet of paper has been pressed upon the stone or zinc previously inked the paper receives ink only from the surface represented by the design. Such a printed sheet is called a lithograph. Where two or more colors are desired they are secured by making separate impressions.

Most of the paper used for bill posters on signboards is lithographed. The art has been so refined that the better grade of map making employs the process in the manufacture of high grade maps. Practically all of the modern lithographing is done from zinc surfaces. Stone is too heavy, to expensive, too easily broken and too difficult to store to make it entirely satisfactory in a commercial way. Many

hundreds of sheets of zinc can be stored in the same room that would be occupied by a few dozen lithograph stones.

Unlike steel engraving, which affords remarkable opportunity to bring out lights and shadows and to indicate perspective, with the delineation of solidity and relief, the engraving for lithograph work can only show objects as in the same plane. One may compare, for example, a portrait on a piece of paper money, done by steel engraving, with the best available lithograph.

Lithographing is used extensively in the manufacture of letterheads, checks, drafts, and other types of commercial stationery. The design is first made by an engraver and is then transferred photographically to a sheet of zinc. Eight average size letterheads are lithographed at a time from the same sheet of zinc and are subsequently cut apart. In lithographing bank checks the original design is transferred to the zinc thirty-six or forty-eight times, so that at each revolution of the "off-set" press three or four dozen impressions are made. When it is recalled that the press turns over 3600 times in an hour it is easy to see that a large quantity of work is turned out in a short time. Firms using letter-heads or banks using checks in large quantities find lithographing much cheaper, and usually much more satisfactory, than printing.

Lithuania, one of the new states of Europe, created after the close of the World War. It lies north and east of Poland, and includes, wholly or in part, the former Russian province of Kovno, the provinces of Vilna, Godno, Suvalki and Courland, and has an area of 59,633 square miles. Between Poland and Lithuania a neutral zone, rather indefinite in outline, was created, of which both Poland and Lithuania claim possession.

Industry and Commerce. The Republic of Lithuania is in part heavily forested, and is marshy in other places. It is watered by the Dniester, Dvina, Pripet, Niemen and Berezina rivers. Agriculture is the principal industry, though in the forests is great potential wealth. About 45 per cent of the total area is arable, producing rye, wheat, barley, flax, oats and potatoes, and most of the fruits native to the temperate zone. Brewing, distilling and milling are important, and other industries have lately come into existence and bid fair to prosper. Bee keeping has attained considerable importance since the establishment of the republic. About 80 per cent of the forests consists of pines, and there are also good stands of beech and oak.

Lithuania is well favored in the matter of transportation facilities; there is a total of 1,550 miles of railroads in the country; 117 miles of waterway are navigable for larger steamers and 453 miles for smaller craft. Boats may ply the Niemen for 270 days in the year. There are approximately 1,000 miles of good highways. The principal articles of export are lumber, flax, linseed, corn, cattle, hides and wool; while machinery, agricultural implements and fertilizer are the important imports.

Education and Religion. The educational system of Lithuania is not entirely modern and not wholly adequate, but there are indications that it soon will be improved. Primary instruction was provided for in 1922 by 1,708 schools, and secondary instruction by 93 schools. In February, 1922, the University of Kovno was opened. At that time it had 25 professors and about 800 students. This is the most up-to-date institution in the country.

Government. This country is a democratic republic. Executive power is vested in a President and a cabinet of ministers, and sovereign power in the constituent assembly, which elects the President. All the citizens of Lithuania, no matter what their color, nationality, sex or creed are equal before the law, and there is full freedom of conscience, speech and press. The right of organizing and striking is declared inviolable. The republic is divided into 20 administrative districts; the capital is Vilna.

History. Lithuania was for several centuries under the rule of Poland; early in the thirteenth century it became a Grand Duchy, and in the century following passed under Polish rule, being definitely united, however, not until 1569. The close

of the eighteenth century saw both Poland and Lithuania divided, Greater Lithuania going to Russia and Lithuania Minor to Prussia.

Independence for Lithuania was demanded in 1917, and the Lithuanian State was proclaimed in 1918. Russia and almost all the powers extended recognition to the new state, and it was admitted in 1921 to the League of Nations.

A strong Polish element in the Lithuanian population was the cause of political turmoil of a serious nature after the creation of the new state. This element consistently agitated for union with Poland, a union repugnant to the mass of the people. As a result of this, there were two governments in the republic for a time, one at Vilna and one at Kovno. Poland declared Lithuania subject, but the latter ignored the declaration. A source of contention between the two states was the neutral zone, claimed by each.

Lithuanian irregulars crossed the border into the debated Memel district of the former German Empire in 1923 and captured Memel City. This further complicated the already dangerously involved middle-European situation.

STATISTICS. The following are the latest statistics to be obtained from trustworthy sources:

Area, square miles	59,633
Forest area, square miles	11,926
Population	6,699,200
Chief Cities:	
Vilna	214,600
Kovno	90,300
Grodno	61,600
Memel	32,000
Suvalki	31,600
Number of districts	20
Members of legislature	112
National revenue	$135,000,000
Farm area, acres	13,000,000
Rye, bushels	23,214,000
Oats, bushels	17,500,000
Wheat, bushels	1,880,000
Potatoes, bushels	37,000,000
Barley, bushels	8,190,000
Domestic animals:	
Horses	300,000
Cattle	780,000
Sheep	1,056,000
Swine	1,262,000
Imports	$175,000,000
Exports	$127,000,000
Miles of railway	1,550
Number of schools	1,801
Pupils enrolled	177,379

Litmus, a blue coloring matter procured frome certain lichens. It is prepared chiefly in Holland. The lichens are ground fine and allowed to ferment. Alum, potash, and lime are then added. Paper tinged blue by litmus dye is used in the laboratory as a test for acids and alkalies. If a liquid turns litmus-paper red, it contains an acid. If a strip of paper previously reddened in an acid be turned blue again, the liquid contains an alkali.

Little Bear. See CALLISTO.

Little Dorrit, a novel by Charles Dickens, published serially 1855-1857, and appearing in book form soon afterward. Little Dorrit is the "child of the Marshalsea," the debtors' prison. The story involves many characters, but the plot is not intricate. The evils of imprisonment for debt are shown clearly.

Little Entente. The Little Entente, comprising Czechoslovakia, Rumania and Jugoslavia, was consummated in October, 1920.

This combination of nations has recently added Poland and Austria to its former number, these additions being made by agreements between the representatives of the Entente and the respective nations. Thomas G. Masaryk and Dr. Edward Benes, President and Premier respectively of Czecho-Slovakia were the prime movers in securing these additions, and great credit is due them for cementing the union.

Central Europe now has five nations united in the interests of peace and stability, and this union will be able to prevent further political disaster and war in this part of the continent.

The agreement with Austria is regarded as an especially happy omen, since it marks a definite reconciliation between Austria and Czecho-Slavakia, whose differences after the formation of the latter republic threatened the peace of Central Europe.

Little Lord Fauntleroy, Mrs. Frances Hodgson Burnett's most popular story. It was published serially in *St. Nicholas* in 1885, and later in book form. The story was dramatized and met with success on the stage quite as great as that won by the story.

Little Nell, a child character in Dickens' *Old Curiosity Shop.* Brought up without the care of a mother or other woman, she is protected in her innocence and purity by her grandfather, who is finally led into gambling through his poverty and his fears for the child's future. Having lost his little all, the two wander forth penniless. During their travels on foot from place to place the little girl is utterly unselfish in her devotion to the weak and broken old man. The account of the death of little Nell has been a favorite with public readers, and is one of the best known passages in all of Dickens' works.

Little Red Riding Hood, a well known fairy tale published in French in a collection of stories by Charles Perrault, which appeared in 1697. The story has long been popular in German and in English, as well as in French. It is told in different forms. In the German tale, the wolf devours the grandmother and little Rothkäppchen herself, but, with a beautiful disregard for the processes of mastication and digestion, a hunter appears on the scene, rips open the wolf and rescues the prisoners. In the English version, the hunter comes in time to save Red Riding Hood from the jaws of the wolf. The grandmother is, presumably, too old to mind being eaten, and all ends happily. This is a favorite tale among children everywhere.

Little Rock, Ark., the capital of the state and the largest city, is also the county seat of Pulaski County. It is near the geographical center of the state and is 128 miles west-southwest of Memphis, Tenn. Little Rock is on the Arkansas River, which is navigable to this point almost all year; and the city is also served by the Rock Island, St. Louis Southwestern and St. Louis, Iron Mountain & Southern railroads. In 1920 the population was 65,142, more than twice that of the next city—Fort Smith.

Location. Little Rock has an extremely pleasant location on the south side of the river. On the north side is Argenta, a town of 11,000, separate and distinct from Little Rock. Just westward are the foothills of the Ozark Mountains, and through the center of the city, dividing it in half, flows the Arkansas River. The original settlement was made on the south bank of the river on a high rocky bluff. Ten miles above Little Rock is another bluff, considerably larger than this one on which the settlement was made. This the pioneers called "Big Rock," giving their village the name Little Rock in order to mark the distinction between the two bluffs. The larger bluff is now the site of Fort Logan H. Roots. The river is spanned by five handsome bridges, the latest just completed at a cost of over $1,000,000.

Institutions, Buildings, etc. Little Rock is a well planned, beautiful city, with lighted, paved and shaded streets, fine parks—one containing thirty-five acres—and attractive residences and public buildings.

The city is the seat of Philander Smith College, Little Rock College, a Catholic institute, and Mt. St. Mary's, girls' seminary, the Arkansas Baptist College and Shorter College, both for colored students; and the medical and law departments of the state university. The state capitol, a handsome structure built of native marble, occupies a conspicuous position in the city. The state prison is located here, as well as the State Reform School, State School for the Blind, State Deaf-Mute Institute; Children's Home; Old Ladies' Home, a United States Weather Bureau station, and state, Carnegie and collegiate libraries.

Industry and Commerce. This city is the trading center for a large extent of territory producing cotton, fruit, lumber, live stock and bauxite ore; it also has a large trade in the products of its own manufactories. There are railroad shops, cotton gins and compresses, granite quarries, foundries and machine shops, bauxite crushing plants, flour mills, planing mills, brick and tile works, and factories for the production of furniture, twine, staves and numerous other commodities.

History. The first settlement was made here in 1814; and in 1820, when the population was less than 20, the village was made the seat of the territorial government. In 1831 it was incorporated, having then a population of 500. Little Rock was captured by the Union army

under General Steele on September 10, 1863, and was held until the close of the Civil War. The city has enjoyed a rapid growth since 1860, when the population was only 3,727.

Little Women, a story for girls by Louisa M. Alcott, published in 1868. It is based on the girlhood experiences of the author and her three sisters. *Little Women* has been one of the most popular stories ever written, and is still a great favorite. See ALCOTT, LOUISA M.

Liturgy, lĭt'ŭr-jy, an appointed form of public worship. Such forms are given in the missal, breviary, etc., of the Roman Catholic and the Greek Church, and in the English Book of Common Prayer. Services are arranged for such occasions as the holy communion, daily prayer, baptism, confirmation, marriage, penance, visitation, and unction of the sick or dying, the ordination of the clergy, etc. Modern liturgies have been drawn largely from Jewish sources. The book of Psalms and the New Testament have supplied a large amount of liturgical material. See LITANY.

Liver, the gland that secretes bile. It is the largest gland in the human body, and weighs from three to four pounds. It is a flat, broad, soft organ situated below the diaphragm, and fitting into its arched surface. The bile, a thin, yellow-green, alkaline liquid, is secreted by the liver, and is conveyed to the gall bladder or into the small intestine direct when digestion is going on. The liver serves also as a storehouse for excess sugar. The liver is susceptible to irritation from the use of alcohol. Alcoholic stimulants sometimes cause a thickening of the walls that form the framework that carries the cells of the liver until the cells become so crowded that they cannot do their work and death ensues. In such cases an examination reveals a liver covered with small knobs, due to the hardening and contracting of the connective tissue. A liver in this condition is called a hobnailed or gin-drinker's liver.

Livermore, Mary (1821-1905), an American reformer and lecturer. Her maiden name was Mary Ashton Rice. She was a native of Boston. She was married in 1845 to the Rev. D. P. Livermore, a Universalist minister—an anti-slavery lecturer. In 1862 Mrs. Livermore was made northwestern agent of the United States Sanitary Commission with headquarters at Chicago. She was noted as a lecturer in the interest of woman suffrage and temperance. She was for many years president of the Massachusetts Woman's Suffrage Association and of the Woman's Christian Temperance Union. She wrote several books, including *Pen Pictures, Thirty Years Too Late, My Story of the War,* and *The Story of My Life.* Her list of lectures included *Women of the War, The Moral Heroism of the Temperance Reform, What Shall We Do With Our Daughters?* etc. See HOWE; STANTON; WILLARD; ANTHONY.

Liverpool, a city of England. It is situated in the county of Lancaster on the right bank of the estuary of the Mersey. It is about three miles from the open sea. In size and commercial importance it is the third city of the United Kingdom. The quays, docks, and warehouses rival those of London. Birkenhead, across the Mersey, occupies much the same geographical relation to Liverpool that Jersey City bears to New York. The twenty-two miles of wharfage of Liverpool, including docks, are supplemented by nine miles of wharfage at Birkenhead. These works are so extensive that charges of over $1,000,000 a year are collected from shipping. An equal sum is derived from immense warehouses constructed at public cost. Immediately in front of the center of the city is an immense floating platform sustained on pontoons. It is two-fifths of a mile long and eighty feet wide. It is connected with the city by seven light bridges and a floating bridge for heavy traffic 550 feet in width. It cost nearly $2,000,000. This float, or "landing stage" as it is called, rises and falls from fifteen to twenty-one feet with the tide. Ferries ply back and forth between it and a similar float on the Birkenhead shore. Small seagoing steamers, and the tenders of ocean liners take their passengers and expressage from the float.

Liverpool was established originally in the reign of Henry II, as a stronghold and a center of operations against northern Ire-

land. A local business, with ports on the Irish Sea, grew up. In 1709 a small artificial harbor or wet dock was constructed with floodgates to be closed at high tide, so ships might ride at the wharf within, though the tide without had gone down. This was the first dock of the kind.

The discovery of America opened up a large West Indian business, and, during the prevalence of the slave trade, Liverpool was the world center of this nefarious business. The Liverpool slaver took aboard a cargo of hatchets, knives, colored cloth, beads, mirrors, bracelets, necklaces, pinchbeck ornaments, and other gewgaws, and set sail for the coast of Africa, where these commodities were exchanged for a load of negroes. The negroes were taken to the West Indies and exchanged for a cargo of rum, molasses, and sugar. The profits of a single trip were enormous. It is said that five-sixths of the slave trade centered in Liverpool. As late as 1807, when the traffic was forbidden, there were 185 Liverpool ships to be put out of the trade. They had carried 43,755 slaves from Africa to America in that year.

The present trade of Liverpool is almost beyond computation. Liverpool ships are found in all quarters of the globe. The traffic with the New World centers in Liverpool. American wheat, flour, meat, and cotton land chiefly at Liverpool. Until of late Liverpool was the chief port of outlet and inlet for the manufactures and the raw materials of Manchester. Liverpool merchants were much opposed to the construction of the Manchester ship canal, which permits a part of the former business to pass on to Manchester without being transferred at their wharves.

Liverpool is a well built city. The public buildings are of more than ordinary architectural interest. St. George's Hall, a combined music hall and law court, is one of the finest modern buildings in Great Britain. A free library, museum, and gallery of arts have been established at public expense. The affairs of the city have been managed with intelligence and fidelity. The population in 1921 was 803,118.

Liverpool is of great interest to the engineer and merchant, but its buildings, however imposing and commodious, are too modern to attract the ordinary tourist. Travelers take train, usually for Chester or London, without stopping to look about. The water of the river is indescribably dingy and dirty, giving rise to the pardonable pun, "The quality of Mersey is not strained."

Liverpool, the capital of Queen's County, Nova Scotia, is at the mouth of the Mersey River, 112 miles by rail from Halifax, and is on the Canadian National Railways. It has an adequate harbor, and ship building is an important industry. There are tanneries, leather goods factories, saw and planing mills, iron foundries, granite quarries, pulp and paper mills, and other industries. Population, 2,294.

Liverpool, University of, was founded in 1881 as University College at Liverpool, Eng. At one time a part of Victoria University, in 1903 it became independent. It includes five faculties—arts, science, enginering, law and medicine. The university lays particular emphasis on the study of the arts. Its medical faculty has achieved an enviable reputation through its school of tropical medicine.

Liverwort, a flowerless plant allied to the mosses. The liverworts are divided into several classes. Those of one group have what are known as thalloid, prostrate fronds, looking as much like bits of green, corky leather as anything else, except that they are tender and often bear cups. They may be attached to the soil by rootlets on the under surface, or they may float, or they may be submerged. Those of the marchantia group, known as the common liverworts, grow in moist shade. The stem is a flat, prostrate, ribbon-like body, having no leaves but rooting in the mud. The upper surface bears cups and umbrella-shaped growths, both of which are concerned, though quite independently, in the propagation of the plant. The "cups" produce "buds." The umbrellas produce spores. Liverworts of still another sort look very much like leafy mosses. They may be distinguished, however, by the fact that the leaves are arranged in two ranks. All liverworts are propagated by powdery spores produced in little capsules. The members of the family are partial to stagnant waters.

to shady banks, and damp places around springs. The best month for their study is June. They are of little practical interest to anyone but the botanist. See MOSSES.

Livingston, Edward (1764-1836), an American jurist and statesman. He was a native of Columbia County, New York. His grandfather, Robert Livingston, obtained a royal patent to the Livingston manor, a beautiful tract on the Hudson comprising the greater part of the present counties of Duchess and Columbia. Edward was graduated at Princeton in 1781 and was admitted to the bar. In 1795 he was sent to Congress and was subsequently mayor of New York City. During an epidemic of yellow fever in 1803 he showed great courage and determination in preventing the spread of the disease. Through exposure, he was stricken down by the fever, and recovered later to find that his private affairs were in great confusion, and that a confidential clerk had stolen public funds. Livingston turned over all his property toward the payment of debts, and removed to New Orleans which had just been acquired by the United States. Here he built up a large practice, and was able to pay his creditors in full. During the war of 1812 he was one of those who held New Orleans for the American cause. He coöperated with General Jackson in arranging the battle of New Orleans, and so won his confidence that, when Jackson became president, he made Livingston his secretary of state, and later sent him as minister plenipotentiary to France. When Louisiana was acquired by the United States the courts were governed by French law. To meet new conditions, Livingston prepared a code, since known by his name. It was written in French and in English. It attracted much attention both at home and abroad. It has influenced legislation in this country, particularly in the punishment of crime and the management of penitentiaries.

Livingston, Robert R. (1746-1813), an American statesman. He was a member of the celebrated Livingston family of New York. He was an older brother of Edward Livingston. He was graduated at King's College, now Columbia, at the age of nineteen, and began the practice of law in New York. He held office under the city, but was removed by British influence on account of his Revolutionary sympathies. In 1776 he was a member of Congress, and was appointed on the famous committee that reported the Declaration of Independence. He was also a member of the convention that drafted a state constitution for New York. He was the first chancellor of the state of New York, in which capacity he administered the oath of office to the first president of the United States. In 1801 he was appointed minister to France by President Jefferson. He was the latter's chief agent in the purchase of Louisiana. Like his brother, Livingston was a man of uprightness and patriotism He was glad and proud to serve his country, but was not greedy for office. In 1804 he withdrew from public life and spent his remaining years in travel and in promoting agriculture. One of his latest services, showing an interest in the public welfare, was the assistance of Robert Fulton in the construction of the first steamboat to navigate the Hudson River.

Livingstone, David, a celebrated African missionary and explorer. He was born March 19, 1813, at the village of Blantyre, Scotland. He died May 1, 1873, at Chitambos village in interior Africa. His parents belonged to the best class of Scottish peasantry. He was bred to the trade of weaving. An anecdote illustrative of David's character is told of his early boyhood. His master having spread a web of cloth on the village green to bleach, desired David to hold one end while they stretched it out, that it might measure as much as possible. David, considering the stretching dishonest, rather than comply, suffered himself to be dismissed. At the age of twenty-three he was able, by strict economy, to undertake a portion of a college course. He had an ambition to go as a missionary to a foreign land. In 1838 he went up to London and was accepted by the missionary society. He then entered upon a special course of preparation in theology and medicine, saying shrewdly that the best way to reach men's souls lay through their bodies. Livingstone's heart was set on going to China, but it was thought best to send him to Africa. In 1841 he landed at Algoa Bay, east of Capetown, and proceeded northward 700

miles to the station of Kuruman, about 250 miles north of the present city of Kimberley. The greater part of the trip may be made now by rail, but it was then a tedious inland journey with oxen through a land infested by lions and occupied by wild beasts and scarcely less wild natives. An ox was likely to drop dead at any time from fever contracted by the bite of the tsetse. At Kuruman he joined the missionaries, Hamilton and Moffat.

Livingstone's labors in Africa may be divided into four periods. The first was devoted to missionary work, the others to exploration with a view to opening up the country for missionary effort. As soon as he had taken time to look about and learn the language of the natives, he founded a station 200 miles northeast of Kuruman, on the headwaters of the Limpopo River, and conducted thither his wife, Mary Moffat, the daughter of his Kuruman host. While here his left arm was crushed by a lion. He had a knack of gaining the confidence of the natives, and removed his station forty miles northward and again forty miles westward, followed each time by the native tribe among which he had settled. In 1849 he was visited by two English sportsmen, Messrs. Oswell and Murray, and with them undertook a journey northward. They crossed the Kalahari Desert and, August 1st, reached Lake Ngami, one of the fountains of the Zambesi River, then seen for the first time by white men. The next year he returned with his family to the lake and attempted to reach a region 200 miles beyond, but was deterred by the sickness of his children. A year later he discovered the main stream of the Zambesi. He now decided to send his family to England, and went with them to Cape Town. He saw them safely aboard ship and again turned his face northward.

With the aid of native helpers, and no longer harassed by fears for the safety and health of wife and children, he now made two notable trips: one to the northwestward, in which he succeeded in reaching Loanda, a Portuguese town on the Atlantic coast, shown on the schoolboy's map of Africa, and one to the eastward, in which he discovered the famous falls of Victoria in the Zambesi and traced that river to its mouth at the Indian Ocean. These journeyings from ocean to ocean occupied two years and a half. He then took ship for home, arriving December 12, 1856, sixteen years after his departure. He wrote an account of his experience, *Missionary Travels and Researches in South Africa.* It was told in simple language, but it stirred up a wonderful interest in that region. It is still one of the most trustworthy and interesting books of travel ever written. Accounts of the deserts, rocky ridges, grassy plains, lakes, rivers, the habits of the ostrich, gemsbok, gnu, giraffe, lion, hippopotamus, and crocodile, travel on foot and on oxback, by cart and by raft, the mist-enveloped falls of Victoria, the huts and customs of the natives, flowers, trees, and the ravages of the tsetse fly and fever, are given in an unpretentious way that carries the impression of truthfulness. *Livingstone's Travels,* as the volume is called usually, is an excellent boys' book. No better picture of the region when first seen by white men could be desired.

Livingstone allowed himself little more than a year for rest. March 10, 1858, he set sail for the mouth of the Zambesi, this time with a government appointment as consul and commander of a party of men bent on an exploration of the Zambesi basin. A party of missionaries followed soon after. Livingstone located them as well as he could. He and his party discovered and surveyed Lake Nyassa. In 1862 he returned to the mouth of the river to welcome Mrs. Livingstone, who had come out, bringing with her a river steamer of stout construction, built after a plan furnished by him with the money derived from the wide sale of his *Travels.* He named the boat the "Lady Nyassa," and made trips of considerable length. Meanwhile the missionaries mentioned were carried off by fever, and Mrs. Livingstone died. In 1864 the intrepid explorer was recalled to England. The government seemed disappointed in the results of the expedition, and the missionary people were discouraged with the failure of the mission. Livingstone now wrote a second volume, entitled *Narrative of an Expedition to the Zambesi and Its Tributaries.* It presented a sad picture of the slave trade.

In 1865 the British Geographical Society and private friends united to send Livingstone out on a third trip of exploration. The government granted $5,000 and gave him a consul's commission. He arrived at Zanzibar by way of Bombay, January 28, 1866. He set out in search of the headwaters of the Nile, the "fountains" of Herodotus. He was unheard of so long that the civilized world grew uneasy. James Gordon Bennett, proprietor of the *New York Herald,* sent an expedition in search of him under Henry M. Stanley. Stanley reached him in the interior in October of 1871, and left him in March of the following year. Livingstone, encouraged by the supplies brought him by Stanley, set out with renewed courage. He became involved in swamps, however, and his strength gave out. His followers placed him in a litter and toiled forward. Early on the morning of May 1st his colored boys found "the great master," as they called him, kneeling by the side of his couch, dead. The faithful blacks took up his body, reverently cared for it as best they could, and carried it with his books and instruments clear to the coast of Zanzibar. His remains were borne with honor to England and placed with mourning amid the nation's great in Westminster Abbey. He kept up his notes and diary to April 27th, within forty-eight hours of his death. The *Last Journals of David Livingstone in Central Africa* were edited by an old friend, making the third volume from the traveler's pen.

Dr. Livingstone's labors did much to suppress the Arab slave trade, and to extend British influence in Africa. His memorial tablet, a black slab in Westminster, bears the words: "For thirty years his life was spent in an unwearied effort to evangelize the native races, to explore the undiscovered secrets, and abolish the desolating slave trade of Central Africa."

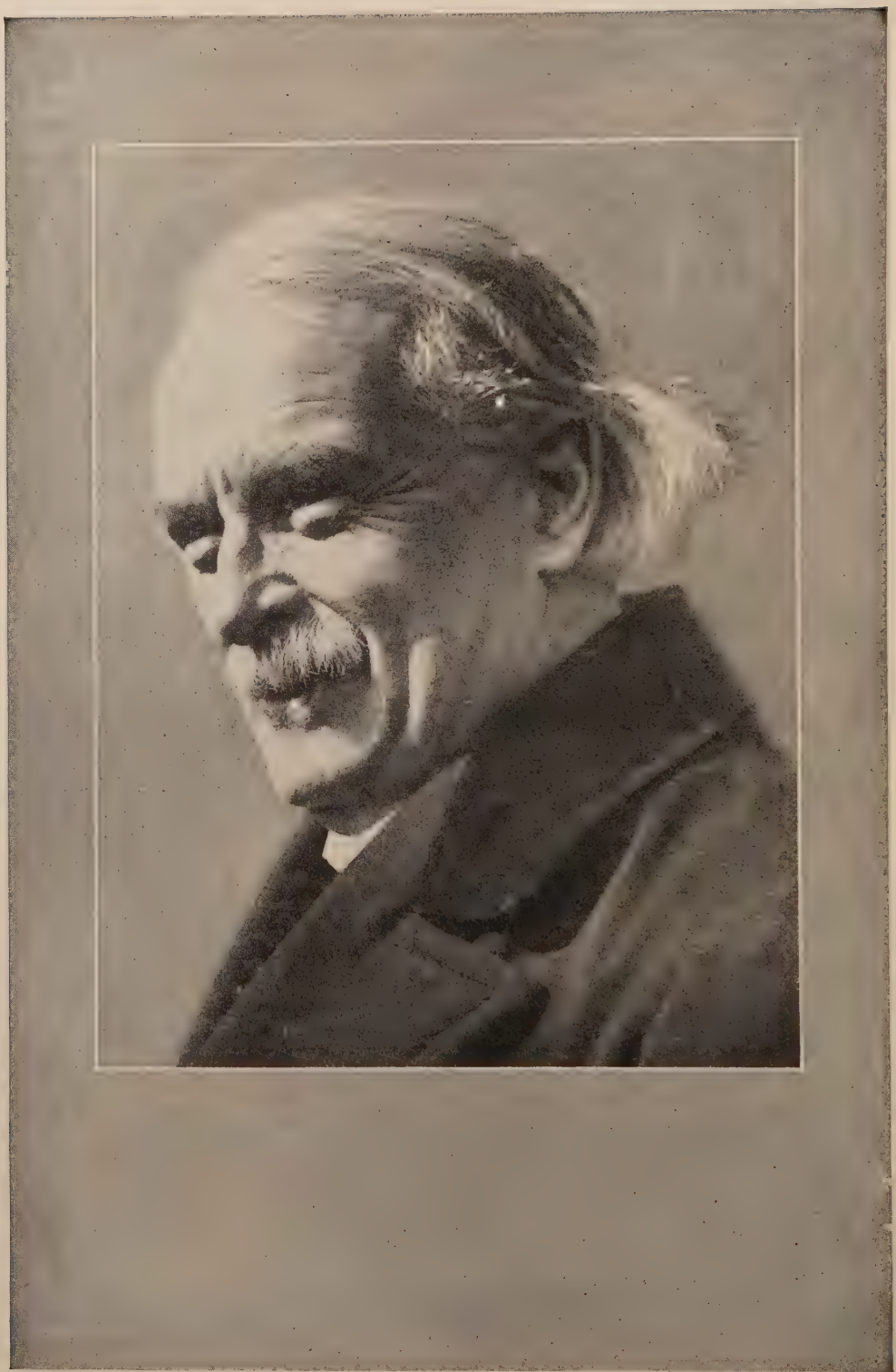
See STANLEY; SPEKE; AFRICA.

Livy, liv'ĭ, a Roman historian much read in college. Partly from conjecture, authorities have said that he lived from 59 B. C. to 17 A. D., that he was wealthy and well educated, and that he passed the greater part of his life in Rome. He lived in the Augustan age of Latin Literature. His *History of Rome* was written in 142 books. Like all literary works of that day, the only possible copies were made by hand. Only thirty-five books, and two of these are incomplete, have survived fire and the ravages of time. One hundred seven books are lost wholly. Instead, then, of a history of Rome from the fabled founding of the city to the writer's own time, we have only a few valuable fragments. The thirteen books giving the wars with Hannibal are exceedingly valuable. While the material of Livy's *History,* especially the earliest portion, is largely fable and tradition, he gives no doubt the national history of Rome as currently held by the more intelligent people of that city. Livy is a fine story-teller. His style is careless but attractive. Even a college freshman cannot fail to enjoy Livy's way of putting things, nor fail to feel that Livy stood for the best there was in Roman character. Goldsmith, and Walter Scott in his *Tales of a Grandfather,* are thought to remind the reader of Livy's narrative style. See LATIN.

Lizard, a scaly, four-legged reptile without a shell. Leave out the snake and turtle, any other reptile may be called a lizard. The largest lizard known is the crocodile, twenty feet long; the smallest may be held by the dozen in the palm of the hand. Ordinary lizards have two pairs of legs and a long, slender, tapering tail. The middle of each vertebra of the tail has a layer of cartilage that renders the tail liable to snap in too readily without apparent injury to the owner. A new tail grows quickly but it lacks vertebrae. It is merely a gristly tube. The eyes are provided with movable eyelids. The young are hatched from eggs, but do not undergo changes like those of the frog. Lizards live usually on insects, worms, and similar food.

The common lizard or swift is described by Jordan as "greenish, bluish, or bronzed, with black, wavy cross-bands above, throat and sides of belly with brilliant blue and black; scales of back rather large, strongly keeled, pointed, similar to lateral scales; body depressed; tail slender. Length, seven inches. United States, in forests and along fences, north to Michigan; abundant south; varies greatly in color."

There are, counting allied forms, 1,600 kinds of lizards. The deserts of southeast-



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DAVID LLOYD GEORGE

Taken on S. S. Mauretania Arriving at New York, 1923.

ern Asia, the Sahara region, and the coasts of the Mediterranean are noted for lizards. Some of the large lizards of Central and South America are valued for food. The glass snake is a lizard without legs. The gecko of Italy and Jamaica has two toes flattened into sucker-like disks that enable it to run about over stone walls and trees. A brilliantly colored tree lizard, native to the East Indies and Ceylon, is called the flying dragon. It is noted for a fold of skin running along the sides of the ribs. By extending this fold, parachute fashion, the animal is able to swoop like a flying squirrel from branch to branch. It is obliged to run up the trunk, of course, so as to fly always to a lower level. The lizard is to be distinguished from the salamander.

See CHAMELEON; IGUANA; DRAGON; BASILISK; SLOWWORM; SALAMANDER; CROCODILE.

Llama, lä′ma, a beast of burden in the Andean region. The llama is the American representative of the camel, and, like the camel, it is known only as a domestic animal. It is supposed to be descended from the guanaco, a smaller animal. Wild guanacos are very watchful and shy. They live in herds at great heights on the mountains, and seldom come down to the plains in search of food. The llama has no hump on its back. The toes are divided completely and are adapted to traveling in the mountains rather than on sandy plains. The llama is more slender and deerlike than a camel. The tame llama is somewhat stouter and heavier than its wild ancestors. It stands about three feet high at the shoulder, carrying its head at a height of five feet. Llamas are naturally of a pale, reddish brown color, but, like horses, undergo variation of color in domestication. Brown, black, and gray colors are common, with some mottled, some piebald, and a few white specimens. The llama is trained to carry burdens. Long strings of llamas are used in freighting across the Andes. The llama can carry only from 90 to 120 pounds, but it can climb rugged mountain sides where horses could not keep a footing. A llama train makes about twelve miles a day. The flesh of the llama is good for food. The hair is much used for rough clothing by the Indians. Llamas require little or no care. At night they are put into a pen; they sleep winter and summer without covering, and get their own food in the mountains at all times of the year. The llama is to the native of the Andes what the camel is to the Arabian and the reindeer to the Lapp. But with the introduction of railroads, roads, and bridges, the day of the llama as a beast of burden is passing away. See ALPACA; CAMEL.

Llanos. See PAMPAS.

Lloyd-George, David (1863-), an eminent British statesman, Prime Minister of Great Britain during an extremely critical period of her history, was born at Manchester, of Welsh parents. His father died in 1864, and he was taken to a little Welsh village to live with his mother's brother. When only fourteen years of age, Mr. Lloyd-George entered a solicitor's office in Portmadoc, and when twenty-one began legal practice at Criccieth. The young lawyer early took a keen interest in the political affairs of Britain, identifying himself with the Liberal party, and was returned to Parliament for Carnarvon in 1890.

He at once took a prominent part, considering his youth and the rapidity of his rise, in all reform measures put forward in Parliament. Among the bills that he wholeheartedly supported at this time was the Welsh Disestablishment Bill. He opposed the Agricultural Land Rating Act of the Conservatives, the Tithe Rent Charge Act, the Voluntary Schools Act, and was a particularly bitter critic of the Education Bill of 1902. On the South African War, Mr. Lloyd-George took a position of vigorous and consistent opposition. When Sir H. Campell-Bannerman's administration was organized in 1905, Mr. Lloyd-George was chosen president of the Board of Trade, succeeding to the position of Chancellor of the Exchequer in 1908 under Asquith as Premier.

It was in the discharge of the duties of this office that the phenomenal organizing ability, capacity for work and financial capability of the future Premier became most apparent. At this time he had in mind a comprehensive social program, to forward which would involve heavy expenditures. To supply the funds, he laid

a burden of taxation upon inherited, unproductive and exceedingly profitable property while granting large exemptions to the lower middle and the working classes. By this he won the further admiration of the Liberals and the active support of labor. As time went on his social schemes put ever heavier drains upon the treasury, but the Chancellor was as adroit as he was liberal and democratic. His plans for the betterment of the educational system, and for the improvement of the national health and the insurance systems were too dear to him to be forgone, so he levied further income and super taxes.

At the same time, Mr. Lloyd-George was concerned about the situation in Ireland, where the agitation for Home Rule had almost reached the civil war stage. Capital and labor were warring at home, and the World War was in the offing. Always a peace lover, the Chancellor stood out firmly for neutrality on England's part; but when the inevitability of England's participation became apparent he concentrated all his powers on insuring against financial collapse, taking into the work with him the best financiers in the British Isles. In the next year, after the financial situation had been made sound, Mr. Lloyd-George gave his attention to securing to the armies the proper amount of men, and to the men the necessary munitions. He plead with the workers to avoid striking, and with the capitalists to do away with all such conditions as might bring about labor troubles. In May, 1915, he was made Minister of Munitions, and as such continued with new vigor the work he had undertaken during the last months of his Chancellorship. Social schemes were put aside, the successful prosecution of the war taking the place of all else. He was made Secretary of State for War in the summer of 1916, and Prime Minister later in the same year.

As Premier he was well received. By taking into his cabinet the most able men in the country, some of whom were his political opponents, and by creating several new departments, he strengthened England's position in the war, and won the esteem of the other allies.

When the war closed, Mr. Lloyd-George was in a position of great power, and his vital personality dominated the Peace Conference. He was the leader of the group that wished to put on trial those who were responsible for the world catastrophe, especially the German Emperor. Returning to England and appearing more frequently in Parliament, the Premier seemed somewhat reluctant to restore the government to its pre-war status, but was forced to the compromise of reestablishing the cabinet form while retaining a permanent secretariat.

Industrial unrest at home, civil war in Ireland, trouble in the Near East and agitation for independence in India and Egypt—these were the problems that called for immediate solution. To these the Premier applied himself with great vigor; but a multiplicity of causes, the most of them immediately referable to the war and its after effects, made solution very difficult. A certain amount of muddling became apparent in the government's conduct of affairs, and gradually the tide set against the Premier and his cabinet. In 1921 Mr. Lloyd-George lost two valuable colleagues, Lord Milner and Lord Long; his partner in government, Mr. A. Bonar Law, suffered a break-down of health; and affairs became so bad, finally, that in 1922 the Premier resigned with his entire cabinet, after holding high office for fifteen years.

Lloyd's London Exchange, an organization of men and firms engaged in insurance. Originally dealing only in marine insurance, Lloyd's now handles all kinds of risks. It does not undertake insurance as a corporation, this being done by its members on their own account but according to the rules of the Exchange. Member firms are carefully examined before being admitted to the Exchange and hence membership is a certificate of high rating.

The name is derived from that of a coffee house in Tower Street, London, in the seventeenth century, where underwriters met to transact business. In 1774 they opened an office in the Royal Exchange, where it has since remained. It was incorporated in 1871 by act of Parliament, the act being amended in 1911.

Lloyd's is the concentration point for all maritime information. The arrival and departure of all ships is cabled direct from every considerable port in the world. This information is published in *Lloyd's List,* originally published in 1696 as *Lloyd's News,* the second oldest newspaper in Europe.

Member firms accept all kinds of insurance, even that covering "freak" features. A policy was once issued to pay the insured $25,000 in case he should slap his mother-in-law. He had been in the habit of doing so but that lady agreed in writing that if he would stop it she would leave him $50,000 in her will.

Loam, See SOIL.

Lobby, the designation of that part of an assembly hall used by a legislative body where private persons may converse with legislators in order to secure their support of a measure. The persons thus seeking favor are called lobbyists, and the practice, lobbying. In the United States this was caused by the system of legislating by committee instead of openly on the floor of the legislature. Lobbyists, often the salaried and acknowledged agents of various interests, are to be seen in the smallest city hall and at the national capitol, working to have a law enacted or a bill killed, as the case may be. While lobbying is not necessarily a corrupt practice, the likelihood of its becoming so is so great that it is subject to sever censure. As is well known, legislators are often corrupted by gifts of money or promises of place and power, and in recognition of this fact, some states of the Union have made lobbying a felony. A part of the criticism of the lobby is based upon the fact that its acts are usually secret, and that the public cannot know, therefore, the circumstances under which legislative favors are secured.

Lobelia, a genus of flowering herbs and half shrubby plants. Both stem and leaves have a milky, acrid juice abounding in rubber. Showy flowers—blue, red, purple, and yellow—are arranged usually in a terminal or raceme. The corolla is irregular and tubular. It is split down one side almost to the base. The stamens are five, arranged in a tube often protruding from the split in the corolla. There are over 200 species. The most conspicuous wild lobelia of North America is the flaming red cardinal flower. The large blue lobelia is valuable in medicine. Indian tobacco, with an inflated calyx, is a powerful emetic. Kalm's lobelia is a slender plant found in bogs. The common delicate blue garden lobelia comes from the Cape of Good Hope. Other lobelias in favor with florists are from Texas, Chile, and Mexico.

Lobster, a marine crustacean allied to the crab and the crayfish. Like the crab, the lobster crawls over the bottom of the sea like a scavenger, picking up dead fish, oysters, sea snails, and all kinds of flesh that is dead or too sluggish to make its escape. Lobsters are caught by sinking wooden boxes baited with refuse fish. This box or lobster pot has slats pointing inward in such a fashion that entrance is easy and escape impossible. Lobsters are abundant on both shores of the North Atlantic. The fisheries yield about one and a half million dollars worth of lobsters annually. Norway also has extensive lobster fisheries.

The anatomy of the lobster is very much like that of the crayfish. The most noticeable feature is a pair of enormous claws. If the lobster be lifted by one of these, it will shake itself off. It is able to grow a new one without apparent difficulty. A goggle eye is situated at the end of a stalk. It may be drawn into the eye cavity at pleasure. The spawn clings in a mass to the under side of the body of the female some time after hatching. Finally a mass of 30,000 individuals is swept away and floats on the surface, where the greater part of it may be devoured by fishes. The young lobster molts, that is to say, casts its skin, seventeen times during the first year. Full size is obtained in about five years.

The United States Fish Commissioners are making an effort to keep the waters well stocked; 100,000,000 lobster fry are turned loose at one hatchery each year. Along the Atlantic coast, lobster fishing is under the surveillance of fish wardens. It is illegal ordinarily to take lobsters before they reach a length of ten and one-half inches. Smaller ones must be thrown back into the water.

See CRAB; CRAYFISH.

Locarno, Treaties of. The most important event of 1925, and possibly of the first quarter of the twentieth century, was the conclusion at Locarno, Switzerland, on October 16 of the security and arbitration treaties between Great Britain, Germany, France, Belgium and Italy, and arbitration treaties between Germany and France, Germany and Belgium, Germany and Poland, Germany and Czechoslovakia, and the formal signing of these treaties in London on December 1.

At the March, 1925, meeting of the League of Nations, Austen Chamberlain, British Secretary of State for Foreign Affairs, proposed a security pact in which Britain, France, Germany, Belgium and Italy should join. The admission of Germany into the League of Nations was pending and Germany had signified a willingness to enter into more cordial relations with France and other nations.

Following the adjournment of the League of Nations, the leading statesmen of the interested countries gave careful consideration to Mr. Chamberlain's proposal. Negotiations continued through the summer, resulting in the respective nations sending representatives to meet at Locarno Oct. 5. The representatives of each country were accompanied by able advisers and assistants. Premier Mussolini of Italy, who is also Minister of Foreign Affairs, went to Locarno to initial the Security Treaty.

The treaty between Germany, France, Belgium, Great Britain and Italy, generally referred to as the Security Pact, is of the greatest importance.

"The Pact shall enter into force as soon as all the ratifications have been deposited and Germany has become a member of the League of Nations."

THE TREATY

Art. 1—The High Contracting Parties collectively and severally guarantee, in the manner provided in the following articles, the maintenance of the territorial status quo resulting from the frontiers between Germany and Belgium and between Germany and France and the inviolability of the said frontiers as fixed by or in pursuance of the Treaty of Peace signed at Versailles on June 28, 1919, and also the observance of the stipulations of Article 42 or 43 of the said Treaty concerning the demilitarized zone.

Art. 2—Germany and Belgium, and also Germany and France, mutually undertake that they will in no case attack or invade each other or resort to war against each other.

This stipulation shall not, however, apply in the case of:

(1) The exercise of the right of legitimate defense, that is to say, resistance to a violation of the undertaking contained in the previous paragraph or to a flagrant breach of Article 42 or 43 of the said Treaty of Versailles, if such breach constitutes an unprovoked act of aggression and by reason of the assembly of armed forces in the demilitarized zone immediate action is necessary;

(2) Action in pursuance of Article 16 of the Covenant of the League of Nations.

(3) Action as the result of a decision taken by the Assembly or by the Council or the League of Nations or in pursuance of Article 15, Paragraph 7, of the Covenant of the League of Nations, provided that in this last event the action is directed against a State which was the first to attack.

Art. 3—In view of the undertakings entered into in Article 2 of the present treaty, Germany and Belgium and Germany and France undertake to settle by peaceful means and in the manner laid down herein all questions of every kind which may arise between them and which it may not be possible to settle by the normal methods of diplomacy.

Any question with regard to which the parties are in conflict as to their respective rights shall be submitted to judicial decision, and the parties undertake to comply with such decision.

All other questions shall be submitted to a conciliation commission. If the proposals of this commission are not accepted by the two parties, the question shall be brought before the Council of the League of Nations, which will deal with it in accordance with Article 15 of the Covenant of the League.

The detailed arrangements for effecting such peaceful settlement are the subject of special agreements signed this day.

Art. 4—(1) If one of the High Contracting Parties alleges that a violation of Article 2 of the present treaty or a breach of Article 42 or 43 of the Treaty of Versailles has been or is being committed, it shall bring the question at once before the Council of the League of Nations.

(2) As soon as the Council of the League of Nations is satisfied that such violation or breach has been committed, it will notify its finding without delay to the Powers signatory of the present Treaty, who severally agree that in such case they will each of them come immediately to the assistance of the Power against whom the act complained of is directed.

(3) In case of a flagrant violation of Article 2 of the present Treaty or of a flagrant breach

of Article 42 or 43 of the Treaty of Versailles by one of the High Contracting parties, each of the other Contracting Parties hereby undertakes immediately to come to the help of the Party against whom such a violation or breach has been directed as soon as the said Power has been able to satisfy itself that this violation constitutes an unprovoked act of aggression and that by reason either of the crossing of the frontier or of the outbreak of hostilities or of the assembly of armed forces in the demilitarized zone immediate action is necessary. Nevertheless, the Council of the League of Nations which will be apprized of the question in accordance with the first paragraph of this article, will issue its findings, and the High Contracting Parties undertake to act in accordance with the recommendations of the Council, provided that they are concurred in by all the members other than the representatives of the Parties which have engaged in hostilities.

Art. 5—The provisions of Article 3 of the present Treaty are placed under the guarantee of the High Contracting Parties as provided by the following stipulations:

If one of the Powers referred to in Article 3 refuses to submit a dispute to peaceful settlement or to comply with an arbitral or judicial decision and commits a violation of Article 3 of the present Treaty or a breach of Article 42 or 43 of the Treaty of Versailles, the provisions of Article 4 of the present treaty shall apply.

Where one of the Powers referred to in Article 3, without committing a violation of Article 3 of the present Treaty or a breach of Article 42 or 43 of the Treaty of Versailles, refuses to submit a dispute to peaceful settlement or to comply with an arbitral or judicial decision, the other Party shall bring the matter before the Council of the League of Nations, and the Council shall propose what steps shall be taken; the High Contracting Parties shall comply with these proposals.

Art. 6—The provisions of the present Treaty do not affect the rights and obligations of the High Contracting Parties under the Treaty of Versailles or under arrangements supplementary thereto, including the agreements signed in London on Aug. 30, 1924.

Art. 7—The present Treaty, which is designed to insure the maintenance of peace and is in conformity with the Covenant of the League of Nations, shall not be interpreted as restricting the duty of the League to take whatever action may be deemed wise and effectual to safeguard the peace of the world.

Art. 8—The present Treaty shall be registered at the League of Nations in accordance with the Covenant of the League. It shall remain in force until the Council, acting on a request of one or other of the High Contracting Parties notifying the other signatory Powers three months in advance, and voting at least by a two-thirds majority, decides that the League of Nations insures sufficient protection to the High Contracting Parties. The Treaty shall then cease to have effect on the expiration of a period of one year from such decision.

Art. 9—The present treaty shall impose no obligation upon any of the British Dominions, or upon India, unless the Government of such Dominion or of India, signifies its acceptance thereof.

Art. 10—The present treaty shall be ratified and the ratifications shall be deposited at Geneva in the archives of the League of Nations as soon as possible. It shall enter into force as soon as all the ratifications have been deposited and Germany has become a member of the League of Nations.

The present treaty, done in a single copy, will be deposited in the archives of the League of Nations, and the Secretary General will be requested to transmit certified copies to each of the High Contracting Parties.

The arbitration treaties refer chiefly to boundary and commercial questions. While the Security Pact does not "outlaw" war it makes it exceedingly difficult for any signatory nation to make war upon the others.

When the treaties were signed in London it was expected that Germany would be elected to the League of Nations at a special meeting to be called for that purpose in March, 1926. At that meeting a dispute arose over permanent seats in the Council, and the League adjourned until the following September without any election being held. However, all powers which took part in the Locarno activities signed a protocol making the treaties immediately effective.

RESULTS. Among the results of the Locarno Treaties the following seem definite and sure:

1. The supreme importance is the fact that these treaties "mark the establishment of policies among a group of nations which promise to produce most far-reaching and beneficient results throughout the world."

2. Germany is restored to her former position among the great powers on an equality with other European nations.

3. "The treaties framed at Locarno may become the framework of an economic United States of Europe." This opinion was expressed by Maximilian Harder, the German publicist and member of the Conference.

Lochinvar, the hero of a popular ballad, of that name, by Walter Scott.

Lock, a mechanical contrivance used to fasten doors, chests, cupboards, drawers, safes, and the like. The working portions are contained usually in a metal case. The essential working parts are two—a bolt, which is thrown by a key, and a spring to hold the bolt in place. Various devices known as wards are designed to prevent the entrance of a key other than the one belonging to the lock.

Aside from the strength of parts, the value of a lock depends largely on the ingenuity with which the wards are constructed, that is to say, on the skill with which obstructions are arranged to prevent the entrance of a false key. Mortise locks are inserted in a mortise in the lid or door. Rim locks are fastened usually to the inner face of the door. The locks of the ancient Egyptians, Greeks, and Romans were made usually of hard wood. They were little more than wooden bolts. A remarkable wooden lock invented by the Egyptians is still in use, it is said, in Turkey. The bolt contains three holes into which three upright, concealed pins fall when it is shot. The bolt is hollow. When it is desired to release the bolt a slip of wood having three pegs on its upper surface is thrust into the hollow and lifted. The pegs are thus brought into play to lift the pins. This rude contrivance is considered the ancestor of the modern lock and key.

The locksmith of the Middle Ages was an ingenious workman. His locks were made by hand. They were large, ornate affairs. The keys were much too large for the pocket. The housekeeper, the porter, the steward, the monk in charge of the cellars, the jailer, and the merchant fastened their keys to a belt or girdle. The business was combined usually with that of making cutlery and later the locksmith became a gunsmith as well.

Of modern locksmiths, none is more noted than Linus B. Yale of New York, the inventor of the Yale lock. In place of the pins of the Turkish lock, he uses a large number of small metal disks or tumblers, each of which holds the bolt from slipping. The key, which raises them, is a thin slip of metal, possibly two inches in length, having one edge cut into a series of zigzags or notches. The set of tumblers and zigzag of the key match. Only the most skilful locksmith can pick a Yale lock without the individual key made for it.

For time locks, see SAFE.

Lock. See CANAL.

Locke, David Ross (1833-1888), an American satirist and humorist. He learned the printer's trade and later became owner and editor of the *Toledo Blade.* In 1865 he published in this paper a series of letters over the name of Petroleum Vesuvius Nasby. These letters upheld the policy of Lincoln and influenced public opinion to considerable extent during the Civil War. Later Locke made President Johnson the object of his satire. The Nasby letters were collected in book form under the title, *Divers Views, Opinions, and Prophecies of Yours Truly, Ekkoes from Kentucky,* and *Struggles—Social, Financial, and Political —of P. V. Nasby.* Locke also wrote *Hannah Jane* and *The Moral History of America's Life Struggle.*

Locke, lŏk, **John** (1632-1704), an English philosopher. He was born a Puritan. He was educated at Oxford and later in life he joined the English Church. He received his master's degree in 1658 and three years later he was made a lecturer in Greek rhetoric and philosophy. He was inclined to social life, particularly the society of a select company of witty, pleasant people. In 1667 he attracted the attention of Lord Ashley, Earl of Shaftesbury, a prominent figure at the court of Charles II. Locke removed to London and became Ashley's private secretary. The frequent changes at court during the last years of the Stuart family drove Locke into practical banishment more than once. Four years he spent in France; another considerable period of time was spent in Holland. He returned to England in the wake of William III. Locke's reputation rests on a treatise called an *Essay Concerning Human Understanding.* He gave it to his publisher in the year 1689, receiving about $150 for the manuscript. It is a careful investigation of the distinction between knowledge and belief, and the consideration of the grounds on which we may rest assured that we really know. In simple language, it is

an argument for a reliance upon common sense. He held that, in higher matters, each person should adhere to what to him seems proper, and not take another s word for it. "I can no more know anything by another man's understanding than I can see by another man's eyes. Knowledge is a treasure which cannot be lent or made over to another."

Lockhart, lŏk'art, **John Gibson** (1794-1854), an Edinburgh writer. He was a frequent contributor to *Blackwoods,* and became editor of the *Quarterly Review.* He married a daughter of Sir Walter Scott. His *Life of Scott* ranks with Boswell's *Johnson.*

Lockjaw, or **Tetanus,** an infectious disease prevalent among people and the lower animals. Stepping on a rusty nail, or an ugly laceration of the hand with an instrument, was formerly considered a cause of lockjaw. It has been discovered of late, however, that the disease is due to the presence of a minute plant or bacillus which multiplies with great rapidity and poisons the system. It breeds in the ground where live stock, particularly horses, stand. The rusty nail, to which reference has been made, simply introduces the germs into the foot. The disease is a most distressing one. Both people and animals die in paroxysms of pain, with the lower jaw tightly set. The bacilli multiply in the region of the wound and produce a poison which is absorbed by the blood. The skillful physician cauterizes the wound with a hot iron or nitrate of silver, that is to say, burns it out to destroy the colony, and trusts to quiet and careful nursing to bring the patient through. It is said that the germs cannot grow in air, and that opening the wound with a knife and laying it open to the air kills them. A weak solution of bichloride of mercury is a valuable germ killer. The wound may be bathed in this solution. See BACTERIUM; DISEASE.

Lockport, N. Y., an industrial city and the county seat of Niagara County, is situated 26 miles north by east of Buffalo, on the New York Barge Canal and on several important railroads. This city, lying in the heart of the New York fruit belt, derives its name from the locks on the canal at this point. These are two large electrically operated locks with a combined lift of 49 feet that have displaced the old, complicated system of hand operated locks. The New York Central Railroad crosses the canal in the heart of the city on a bridge 500 feet long and 60 feet above the water. The city manufactures pulp and paper, glass, flour, cotton batting, water works, wall board, machinery, etc. It contains a Federal building, an Odd Fellows' Home, a fine high school and several parks. Population in 1920, 21,308.

Lockwood, Belva Ann Bennett (1830-1917), an American lawyer and reformer. She was born on a farm near Royalton, New York. Even as a child she resented the fact that women were practically compelled, as they were then, to remain at home and do nothing but housework. This resentment grew with years. Mrs. Lockwood practiced law in Washington. Refused admission to the supreme court because she was a woman, she secured the passage by Congress of a bill permitting women to take cases before that body, and she then appeared before it several times. Mrs. Lockwood was active in movements for temperance, universal peace, and woman suffrage. She was nominated for the Presidency in 1884 and again in 1888 by the Equal Rights party. As the promoter of a bill giving woman government employes equal pay with men for equal work, another giving them equal property rights and equal guardianship of their children, and other like measures, she helped to better the condition of women throughout the country.

Lockyer, Sir Joseph Norman (1836-1920), an eminent English astronomer, born at Rugby and educated under private tutors at home and on the Continent. In 1857 he was made a clerk of the war office, where he served three years, studying astronomy in his leisure time. In 1881 after having served the government in various scientific capacities, he was made professor of astronomical physics in the Royal College of Science. Since 1874 he has been the editor of *Nature.* His lectures and writings on scientific, particularly astronomical, subjects have been very popular; he is the author of many scientific books. Probably he is best known as the

originator of the meteoritic hypothesis, or the theory that the earth was formed by the gathering together of scattered meteorites. Meteorites are the stony or metallic bodies that have fallen from outer space.

Loco-foco, the name applied first to the Equal Rights party formed in New York in 1835; it was used later in speaking of the whole Democratic party, from the radical section of which the Equal Rights party had been formed. The name arose as an indirect result of the special Democratic bank legislation in New York during Jackson's administration. So open was the favoritism shown and so great the corruption that a certain faction of the Democratic party met in Tammany Hall in 1835 to nominate men for office who were opposed to such legislation. The regular Democrats came up the back stairs and tried to control the meeting, but failed. Then they turned off the lights, and left the radicals in darkness. The reformers, however, had tallow candles. They lighted them with friction or "loco-foco" matches, then of rather recent invention, and carried out their plans. The newspapers got hold of the story, and were responsible for the nickname. Though the party failed to elect its candidates it influenced national politics to a considerable extent for some time afterward.

Locomotive, a steam-engine designed to run on a track and draw cars after it. The invention of the locomotive belongs to England. Sir Isaac Newton gave a hint in 1680. Murdock contributed a steam road-wagon in 1784. Richard Trevithick exhibited the first successful locomotive in 1803. It had four driving wheels and no others. He turned the exhaust steam into the smokestack to increase the draft. He used one cylinder, eight inches in diameter and fifty-four inches long. The first successful railway was opened in 1825. The cars were pulled by a locomotive designed by George Stephenson, who is not infrequently given credit as the inventor. Between 1803 and 1830, when the locomotive may be said to have become an established success, a number of famous locomotives were shown. They were named like race horses. Puffing Billy was built on the model of a grasshopper. The steel legs of the insect moved the wheels of the truck. Blucher, Hope, Black Diamond, Diligence, Experiment, Royal George, Novelty, and Sanspareil were favorites. Rocket, built also by Stephenson, won over all competitors in a trial called the Rainhill contest, in 1830.

The first locomotive in America was built by George Stephenson and was imported by the Delaware and Hudson Canal Company, arriving January 18, 1829. It was called the America. Another engine called the Stourbridge Lion by another English maker, but imported by the same firm, was the first actually to run on American soil. With English models before them American mechanics began the manufacture at once. American locomotives began to come on the market in 1832. The steam whistle is also an English invention dating from 1833. The first American builder was Peter Cooper of Cooper Institute fame. His first locomotive, a mere model named Tom Thumb, was completed in 1829. The names of Phineas Davis, Ross Winans, and Matthias Baldwin appear among the early designers. Best Friend and Old Ironsides were famous American engines built on English models.

American builders soon inaugurated changes to suit American conditions. The four-wheeled swiveled truck is one of these innovations. It permits the engine to round a sharp corner. The rocking feature, enabling an engine to adapt itself to an uneven track, is American. The cowcatcher is not seen on European railways. Among the points of construction readily understood by the ordinary reader is the use of large driving wheels on passenger locomotives for speed, and smaller wheels on freight locomotives for drawbar power in hauling heavy loads. The tendency has been to build engines heavier and heavier, until the standard engine of the eighties seems like a plaything by the side of the modern freight locomotive of the Mogul or Consolidation type. Care in the construction of roadbeds and increase in the weight of rails have necessarily kept pace. A freight engine of the largest type (1923) weighs about 270 tons, costs from $75,000 to $80,000, and can haul over 100 loaded cars under ordinary conditions.

The improvement of the steam locomotive, more than all other elements in railroad operation, has made possible the phenomenal growth and development in inland transportation in America and brought about the efficiency and great success attained during the short period of 90 years of American railroad history. It may indeed be said that, more than any other factor, it has made possible the rapid strides of the United States as a great nation.

On January 1, 1923, there were approximately 64,500 locomotives in service on the Class I railroads of the United States, that is, those having operating revenues of $1,000,000 a year or over, which constitute the great bulk of railway mileage in the country. Orders placed for locomotives by Class I railroads in 1922 totaled 2,204 out of a total of 2,279 ordered for domestic railroads during the year from the Baldwin Locomotive Works, the American Locomotive Company and the Lima Locomotive Works, which are the leading builders. The types of freight locomotives built in 1922 include light and heavy Mikados, the Mallet type, Consolidation, Pacific and Mountain types, and switchers. The most powerful passenger locomotives in the world were placed in service on the Denver & Rio Grande Western Railroad in 1922. These were locomotives of the Mountain type, built by the American Locomotive Company, and weighed 377,000 pounds, of which 257,500 pounds was carried on the driving wheels. The tenders of these locomotives had a capacity for 14,000 gallons of water and 20 tons of coal.

Recent improvements in locomotive design and efficiency have included the mechanical stoker, the superheater, the brick arch, circulating plates in boilers and thermic syphons in fireboxes, improved valve motions, the feedwater heater, and most recently of all, the booster, which is an auxiliary engine that drives some of the wheels that formerly merely trailed. All these improvements are not found in existing locomotives, but most of them are applied to new engines by the builders.

An important improvement that preceded the later devices for increasing the efficiency of the steam locomotive, and in fact made some of them possible, was the widening of the firebox, in the eighties. Locomotive builders and railroad men then began to design much more powerful engines, and a series of locomotives, beginning about 1896 with several western roads, prepared for the heavy-tonnage idea which was fostered by James J. Hill. When these heavy-tonnage locomotives were brought to what seemed the limits of weight and capacity, the next step was to improve them so as to make the ton of locomotive metal and the ton of coal do more work. The necessity for better cylinder performance brought the superheater, a device for increasing power and saving coal which had previously been adopted in Europe.

Next came the development of the brick arch, supported on circulating tubes, which changed the locomotive firebox into a true furnace, and studies of combustion connected with the arch promise important boiler improvements in the future. Firebox improvements made it possible to get more heat out of the coal. The superheater renders it possible to increase the power of the engine at high speeds. It prevents cylinder condensation, enlarges the volume of the steam, and puts the locomotive in the class of stationary and marine engines in efficiency.

Valve motion has always been a subject of great interest to locomotive designers and inventors. A great many devices have been developed, but did not persist. The way for really improved valve motion was prepared by the advent in America of the Walschaert gear, the general introduction of which began in 1904 with the first Baltimore & Ohio engine of Mallet type. Since that time several very successful valve motions have had more or less general application. The result is a very important improvement of locomotive efficiency.

Mechanical stokers came when more fuel could be burned in a locomotive firebox than a man could fire by hand. The mechanical stoker then became a necessity on big engines, and the United States now

has more locomotives thus equipped than any other country.

Light reciprocating parts are a feature of locomotive improvement that has awaited the coming of improved steels. The American locomotive has developed far beyond the capacity of the ordinary carbon steel for its running gear, and special alloy steels are now available to reduce the weight of the running parts and also to reduce the wear and tear on the rails caused by the rotation of those parts.

The locomotive "booster" is a railroad man's invention of recent date. The wide firebox opened the way for the big boiler. The big boiler called for trailing wheels to support it. These wheels were idle as to traction, but were necessary in order to carry a boiler that would make steam enough to permit of high speeds. The booster applies power to the trailing wheels in starting the locomotive and at hard points on grades, using the weight on the trailing wheels for traction, and operated by the steam which the main engine does not need when running slowly. This power applied to the booster increases acceleration and helps over the sticking points on grades. The locomotive with tractive power and the factors that make for more boiler power can haul at speed trains too heavy for it to start. The booster consequently increases the effectiveness of every other power-increaser.

In the running gear of locomotives remarkable improvements have been made in recent years. Leading trucks and trailing trucks, lateral motion boxes for the leading driving axle, and improvements in couplings between engine and tender, all contribute to efficiency and make a ton of coal do more work. It is impossible to mention all of the improvements that have been effected, but those that reduce the weight of the engine per unit of power are now being generally adopted, since locomotives have about reached their limits of weight and size, unless the country is to pay a heavy price for heavier rails and bridges.

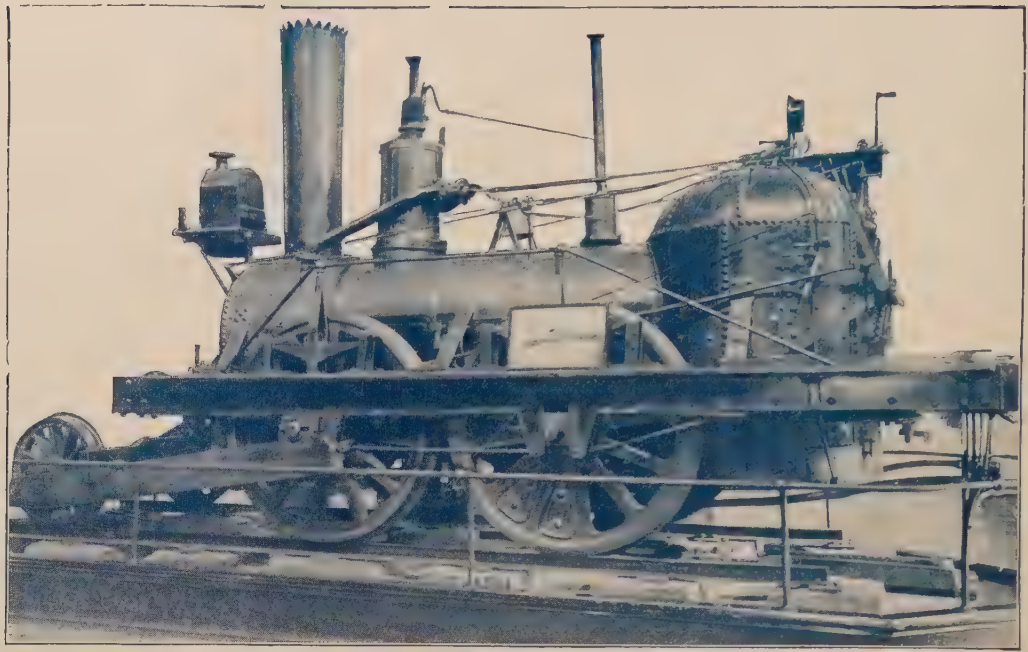
Oil-burning locomotives, consuming fuel oil instead of coal, have recently been placed in operation on American railroads, especially on roads running through territory where oil is in abundant supply. The great strike of coal miners in 1922 promoted the use of oil for locomotive fuel.

The Baldwin Locomotive Works, Philadelphia, is the largest concern of its kind in the world. It occupies 20 acres in the heart of Philadelphia with its principal machine shops and general offices, and at Eddystone on the Delaware River, twelve miles below the city, its immense shops occupy a site of 596 acres, with facilities for the shipment of locomotives by rail or sea. The Baldwin Works, founded by Matthias W. Baldwin in 1831, have reflected the successive stages of American locomotive practice from the very inception of steam railroads in the United States. Baldwin's received its first order for a locomotive from the Philadelphia, Germantown & Norristown Railroad, whose short line of six miles was operated up to that time by horse power. The Baldwin Works now sends its locomotives all over the world. In 1922 it sent a solid train of twenty 2-10-2 oil-burning locomotives, called the "Prosperity Special," on a triumphal trip across the continent, from Philadelphia to Los Angeles, by way of celebrating the return of prosperity to the United States after a period of business depression. The locomotives had been built at the Baldwin Works as a part of an order for the Southern Pacific Company.

General dimensions of a modern locomotive are shown in the following table, which are those of the Union Pacific Mountain type locomotive No. 7000, built in 1922 by the American Locomotive Company to handle passenger trains on the severe grades of the Union Pacific Railroad west of Cheyenne, Wyo. Though not nearly as heavy as many of the latest freight engines, it is the most powerful passenger locomotive that could be designed to meet track limitations.

General Dimensions—Union Pacific Mountain Type Locomotive of 1922

Tractive effort	54,838 lb.
Cylinders, diameter and stroke	29 in.—28 in.
Driving wheels, diameter	73 in.
Factor of adhesion	4.19
Weight on driving wheels	230,000 lb.



ORIGINAL STEVENSON LOCOMOTIVE

MODERN ELECTRIC LOCOMOTIVE

Weight on engine truck	59,000 lb.
Weight on trailer	56,000 lb.
Weight of locomotive	345,000 lb.
Weight of locomotive and tender	582,800 lb.
Coal capacity of tender	20 tons
Water capacity of tender	12,000 gal.
Wheel base, driving	19 ft. 6 in.
Wheel base, locomotive	41 ft. 3 in.
Wheel base, locomotive and tender	79 ft. 11½ in.
Boiler pressure	200 lb.
Boiler diameter	84 in.
Firebox, length and width	126 in. by 96 in.
Tubes, number and diameter	239—2¼ in.
Flues, number and diameter	48—5½ in.
Length of tubes and flues	22 ft.
Length and dia. of combustion chamber	40 in.—60 in.
Superheating surface	1,242 sq. ft.
Evaporating surface, firebox, and combustion chamber	382 sq. ft.
Evaporating surface, total	4,974 sq. ft.
Grate area	84 sq. ft.

Excessive train speeds for long distances are no longer aimed at by American railroads, on account of their expense, and 18-hour trains between New York and Chicago (900 miles) have been discontinued in recent years, but a 20-hour schedule is maintained on the New York Central and Pennsylvania railroads. The fastest run recorded on an American railroad was made in May, 1893, when locomotive No. 999 on the Empire State Express covered a mile in 32 seconds, or at the rated speed of 112½ miles per hour. For short distances, speeds of 70 to 85 miles per hour are daily made by large Pacific type locomotives on various roads throughout the country.

Some important American railroads, including the Pennsylvania, build their own locomotives and the Canadian Pacific also builds its own at shops in Montreal. All but the smallest roads maintain locomotive repair shops. In 1920 there were in all 17 locomotives builders in the United States, employing 26,715 wage-earners, and their product was valued at over $156,000,000.

Electric Locomotives. The electric locomotive has recently become a strong rival of the steam engine, and bids fair to supersede it ultimately as the tractive power of railroads. In the United States and on the continent of Europe the electrification of steam lines has already developed to a considerable extent. In Great Britain the electrification of main lines is still in its infancy. In France, a program of electrification was initiated in 1922, on lines aggregating 5,200 miles of track, and to be completed in 20 years. In Switzerland the electrification of the Rhoetian Railway and the St. Gothard tunnel line through the Alps to Italy has been completed. In Mexico, a section of the Mexican Railway between Mexico City and Vera Cruz was in process of electrification in 1923.

In the United States, the electric locomotive has been developed rapidly, and the longest all-electric runs are found in this country. Great stretches of main line have been electrified and are worked by electric passenger and freight locomotives, some of which are of 4,000 horse power. On the Norfolk & Western Railway coal trains of 3,250 tons are hauled up 2 per cent grades by two electric locomotives at double the speed formerly attained by three of the largest Mallet steam locomotives. The great power of the electric hauler is due to the fact that a much larger percentage of its total weight can be devoted to the apparatus that rotates its wheels, as it carries no heavy boiler but draws its energy from an outside source, the power-house.

On the western or mountain divisions of the Chicago, Milwaukee & St. Paul Railroad, hundreds of miles of main line track have been electrified. The New York, New Haven & Hartford Railroad is partially electrified, and in 1923 electrification projects under way or contemplated included that of the Illinois Central, to be 1,500 volt direct current, and the Baltimore & Ohio, which proposed to increase its electrical equipment. There were 366 electric locomotives in service on Class I railroads in the United States in 1921, an increase of 50 per cent in five years.

Among the important orders received and shipments of heavy traction electric locomotives by American firms during 1922 were twelve 180-ton locomotives for the New Haven road, to operate on third rail at 650 volts direct current and 11,000 volts alternating current; also four 375-ton locomotives for the Norfolk & Western

Railroad, to operate on split-phase trolley. Electric locomotives were also ordered during the year 1922 by the Pennsylvania Railroad, including one to operate on 11,000 volts single-phase trolley that was the largest 25-cycle single-phase railway motor considered up to that time.

Electric locomotives and control equipments were also ordered from United States manufacturers in 1922 by the Chilean State Railways, the Norte Railway of Spain, the Paris-Orleans Railway of France, and the Imperial Government Railways of Japan.

The comparative economy of steam and electric locomotives for railway service is still under discussion. But it is generally conceded by mechanical engineers that electric traction is to be preferred (1) in tunnel operation; (2) in large cities and their suburbs; (3) where sufficient water power is available; and (4) where superpower plants can be built near to an adequate supply of some low-grade combustible for use as the initial fuel of such power plants. In open country, where smoke and gases from locomotive stacks are not seriously objectionable, results of electrification do not yet indicate that electric traction can be carried on with as little coal consumption as modernized steam traction; and great economy in fuel consumption and cost is the principal claim for the use of the electric locomotive. See RAILWAYS; STEAM ENGINE; CAR; ELECTRIFICATION.

Locoweed, lō′kō-wēd, a silvery white, silk-leaved plant of the pea family, native to the great plains region from Texas northward. Botanists call it the woolly astragalus. Live stock, including cattle, sheep, and especially horses, acquire a taste for the locoweed and are unwilling to eat anything else. They lose their eyesight and go into a kind of dementia or craziness, during which they cut up all sorts of antics. Emaciation follows, and the animals perish as if from hunger. The state of Colorado has expended a quarter of a million dollars in attempts to eradicate the plant. There are several species. The specific cause of cattle dementia appears to be the presence of minute quantities of the chemical element known as borium. This element appears to accumulate in the system of the grazing animal until the mischief is done.

Locust, a well known tree belonging to the legume or pea family. It grows to the height of eighty feet. It has thorny branches, delicate pinnate leaves, and dense, drooping clusters of white, heavily scented flowers, shaped like those of the pea. The flowers are succeeded by many-seeded pods. Young plants grow from seeds, as well as from underground suckers, soon forming dense thickets. The wood is heavy, hard, and very durable. It makes excellent fence posts and policemen's clubs. The common locust is known to the botanist as robinia. It is called also the black or yellow locust, and the false acacia. It grows throughout eastern North America. A related shrub from the Alleghanies bears pink flowers. It is cultivated for ornamental purposes. The clammy locust is a small tree with sticky branchlets and leaf-stalks. It grows in the same region. See HONEY LOCUST.

Locust, a family of insects allied to the grasshopper and the cricket. The locust has short antennae—shorter than its body This is perhaps the readiest method of telling a locust from a grasshopper. The abdomen of the female is prolonged into a hollow tube or ovipositor. In late summer the locust bores an oval or cylindrical place in the ground with its ovipositor, sometimes in old wood. It lines the cavity with a gummy, rain-proof substance, fills the hole with eggs arranged with the utmost nicety, and plugs up the entrance. By digging up a bare place by the roadside in autumn these rolls of eggs may be found. In prairie countries a field of freshly plowed sod is a favorite place in which to congregate and lay eggs. Plowing, or any other method that exposes the eggs to weather or buries them beyond the reach of the sun, destroys them. When undisturbed, the eggs remain in these nests over winter. In spring the young hoppers appear, looking for all the world like their parents, except that they are small and are without wings. They eat green vegetation and grow rapidly. They molt several times The male locust is able to make a rasping noise by rubbing his hind legs against the outer surface of his wing covers. This is

supposed to be done for the benefit of his mate, to whom the music is pleasing.

Several locusts are worth especial mention, though nearly all go under the popular name of grasshopper. The Carolina locust, our largest species, is one and one-half to two inches long, and is common throughout the United States and Canada. It is a dusty hopper, fond of dry roads. When it flies it shows a pair of broad, black hind wings edged with a margin of yellow. The male of the clouded locust, also of good size and abundant in meadows, may be recognized by a crackling sound made by rubbing his wings together when he flies. The red-legged locust is common all over the United States, except in the highlands of the West, where its place is taken by a similar insect, the migratory Rocky Mountain locust, the pest of Western grain fields. Like the army worm, the young hoppers of this species travel in long belts, devouring as they go. When full winged, they rise in swarms. Countless—literally countless millions—fill the air like snowflakes. They fly or drift long distances, and descend when night or unfavorable weather overtakes them. If a flight of locusts descends on a farm, grain and corn fields are reduced to mere stalks in a few hours. Trees are stripped of foliage, and the locusts even scrape the lint from a weatherbeaten board fence until it has a new look. If the swarm encounters fine weather it is likely to rise the next day and go on, but if it remains awhile, and the females fill the soil with their cocoon-like pockets of eggs, the chances are that the young will destroy a second crop the following season. Locusts are apt to confine their eggs to especially favorable plots of ground. By ploughing, harrowing, and exposing the eggs to the weather, many are destroyed, and skillful methods have been devised for destroying the young before they get far from their hatching ground. Fortunately this locust cannot survive more than a generation or two away from its high, semi-arid native home.

Locusts are common in Arabia and Africa. The natives catch them for food and eat them fried in butter. Sometimes they are dried in the sun and are ground into a meal used for baking cakes or to thicken soup. The poor of Southern Russia cure them in smoke, like fish. The Jews used to fry locusts in sesame oil. The prophet Joel likens their flight to "the noise of a flame that devoureth the stubble," and the land they pass through is "as the garden of Eden before thee and behind thee a desolate wilderness."

See GRASSHOPPER; CRICKET.

Lodestone. See MAGNETISM; COMPASS.

Lodge, Henry Cabot (1850-1924), an American statesman, and historical writer, was born in Boston, and graduated from Harvard College and from Harvard Law School. He was for a time editor of the North American Review and also lecturer at Harvard on American history. Entering politics, he became a member of the Massachusetts House of Representatives, was elected to the national house of representatives in 1887, and to the senate in 1893. By virtue of his long service in the Senate, Mr. Lodge became a leader of the Republicans, and he identified himself with many important legislative measures. He was a firm opponent of the United States entering the League of Nations. He wrote a large number of works of political and historical importance, including several volumes of the *American Statesmen* series.

Lodge, Sir Oliver Joseph (1851-), an English physicist. He was born at Penkhull, Staffordshire. He received a grammar school education and entered upon a business life, but by studying evenings he was able to enter University College, London, from which he was graduated in 1877, taking honors in physics. Later he received the degree of doctor of science, and was made assistant professor of physics at his alma mater. In 1881 he accepted a similar position at the University College at Liverpool, and in 1900 became principal of the University of Birmingham. He received the Rumford medal from the Royal Society in 1898 and was knighted in 1902. His specialty has been electrical science, and he is the author of many articles on electricity and physics. He became a member of the English Society for Psychical Research, and has conducted some important investigations of psychic phenomena,

publishing the results in current periodicals. Sir Oliver is one of the world's principal exponents of the belief that communication with the dead may be established. After resigning the principalship of the University of Birmingham he made a lecture tour of the United States. Among the books written by Sir Oliver are *Modern Views of Electricity, Signalling Across Without Wires, Pioneers of Science, Life and Matter, Reason and Belief, The Survival of Man, Christopher: A Study in Human Personality, The War and After* and *Raymond, or Life and Death.* The last named is a memoir of Sir Oliver's son, Raymond, who was killed in the World War, and from whom the father believed he had received communications after death.

Loeb, Jacques (1859-1924), an eminent American physiologist and experimental biologist, since 1910 director of the division of general physiology of the Rockefeller Institute for Medical Research. Dr. Loeb was born in Germany and studied in Berlin, Munich and Strassburg, receiving the degree of M. D. at Strassburg in 1884. After teaching in the universities of Wurzburg and Strassburg, he engaged in physiological research at the Naples Zoological Station for a few years, and removed to the United States in 1891. Here he became professor of physiology and experimental biology at the University of Chicago, and in the latter year was made professor of physiology at the University of California, serving there until 1910. Dr. Loeb has made important practical and theoretical contributions to the sciences of physiology and biology. The basis of all his work is his thesis that " all life in all its aspects is mechanistic," that is, that all life can be explained by chemical or physical principles or by a combination of these principles. Important among Dr. Loeb's published works are *The Mechanistic Conception of Life, Artificial Parthenogenesis and Fertilization, Dynamics of Living Matter, The Organism as a Whole, Comparative Physiology of the Brain and Comparative Psychology, Physiological Morphology, Studies in General Physiology, The Heliotropism of Animals and Its Identity With the Heliotropism of Plants,* and a great number of papers on experimental biology.

Loess, lō′ĕs, in geology, a loamy deposit in the valley of the Rhine. It is an exceedingly fine, yellow, silty loam, uniform in character from top to bottom, and showing hardly any signs of stratification. There are, in places, fresh water shells and bones of animals. The term has been extended to formations of similar appearance elsewhere. A vast area in northern China is covered by a loess formation through which rivers have worn valleys of great depth. Authorities assert that the loess of China is nothing less than a vast plain of fine dust carried by the winds from Central Asia. Wherever found, loess has the ability to stand in upright walls; and yet it is so mellow that it can be crushed between the thumb and forefinger. Where it occurs it is always the most recent formation.

Loess occupies several thousand square miles in the drainage basin of the Mississippi. The American loess is thought to have originated from wind-blown material deposited during and after the Ice age. This North American loess extends from Dubuque southward, and is from five to 150 feet deep. It is composed of exceedingly fine, sharp-angled particles indicating an origin by chipping and crushing rather than a chemical origin, or decomposition of rock material. It is almost true that this loess contains a little of everything, for it is composed of at least sixteen elements. Silicon is present in silica, which forms from sixty to seventy-three per cent of the whole; aluminum is present in alumina, which forms from eight to twelve per cent; other compounds present are iron particles, lime, soda, potash, magnesia, and water. There are traces of carbon and sulphur. This soil is amazingly fertile when supplied with nitrogen.

Lofoden (lō-fō′den) **Islands,** a chain of islands on the western coast of Norway. The chain flanks the mainland. It has been compared to a backbone which tapers away to the small vertebra of the tail to the south. At a distance the chain looks like a slender peninsula. There are many bays and straits and rocky islets. The shores are steep; the mountains are picturesque. Some of them

are covered with snow, others with green moss. There are many good harbors and fishing villages where large vessels "dwarfed to nut shells, lie close to rocks several hundred feet high." The Lofoden Islands are noted chiefly for the codfishery which is carried on from the middle of January to the middle of April. At this season the cod come from the depths of the Atlantic to spawn. Forty thousand fishermen and 9,000 boats float to the Lofoden harbors and establish themselves in the fishing centers. Both nets and hooks are used. Storms not infrequently catch the fishermen in exposed situations and drive them away or capsize them. The fish are salted and dried. The heads are converted into fish guano. The spawn is sold for sardine bait. Cod-liver oil is made from the liver. Bergen is the market town. See BERGEN.

Log, a board attached to a cord and thrown overboard to determine the speed of a ship. The cord is knotted with brightly colored bits of cloth at regular intervals. As soon as the bit of board strikes the water astern it remains practically stationary, and as the ship goes ahead, the line runs out and the knots flit overboard with a speed corresponding to that of the ship. From the number of knots that run overboard in a quarter of a minute the ship's officer computes the number of knots the ship runs an hour. This record mapped on a chart serves to tell where the ship is at any particular hour. An automatic log has been invented. It is constructed somewhat on the same plan as the device used on bicycles. One end is in the pilot house; the other end is in the water under the ship. Dials show not only the speed at the moment of observation but the total distance run. See STEAMSHIP.

Log-Book, the official record of a ship, so called because it contains the record of the patent log. It consists of tabulated hourly records of the speed, course and location of the ship, with detailed reports of the weather encountered. At the end of every watch the log is written up and signed by the officer in charge. It contains also an account of all official business, such as courts-martial or inspections, and of accidents, deaths, births, and other important happenings. In the United States Navy, when the book is full, a copy, with each report signed by master and mate, is sent to the navy department where it is kept on file.

Logan (1725?-1780), celebrated chief of the Cayugas. His tribe lived on the Susquehanna. In his youth he was well known to the inhabitants of Pennsylvania and Virginia for unswerving loyalty to the whites. About 1770 he removed his family to the Ohio Valley. Four years later his family was massacred by a party of whites. Canceling his former friendship, Logan organized war bands and fell upon the scattered settlers. For several months he continued a ferocious onslaught marked by scalpings and burnings. When a force of troops appeared in the vicinity he disdained to appear with the other chiefs to sue for peace. In his *Notes on Virginia,* Jefferson quotes a noted speech said to have been sent Lord Dunsmore at the time through an interpreter. It is doubtful whether Logan ever sent such a message:

> I appeal to any white man to say if he ever entered Logan's cabin hungry, and he gave him not meat; if he ever came cold and naked, and he clothed him not. During the course of the last long and bloody war, Logan remained idle in his cabin, an advocate for peace. Such was my good will for the white man that my countrymen pointed as they passed, and said, "Logan is the friend of the white man." I had even thought to have lived with you, but for the injuries of one man. Colonel Cressap, the last spring in cold blood and unprovoked, murdered all the relatives of Logan, not even sparing my women and children. There runs not a drop of my blood in the veins of any living creature. This called on me for revenge. I have sought it. I have killed many. I have fully glutted my vengeance. For my country, I rejoice in the terms of peace, but do not harbor a thought that mine is a joy of fear. Logan never felt fear. He will not turn on his heel to save his life. Who is there to mourn for Logan? Not *one.*

The aged chieftain was killed in an altercation with some drunken Indians. See INDIANS.

Logan, James (1674-1751), an American statesman and author, was born in Lurgan, Ireland. He came to America with William Penn as his secretary. Entering politics, he held the positions of Provincial Secretary, Chief Justice and President of the Council, after which he was acting governor of the Pennsylvania Colony. He

made a great many contributions to literature and science. He was versed in both Latin and Greek and made many translations from these languages into English. Mr. Logan was one of the founders of the University of Pennsylvania and bequeathed to the City of Philadelphia his library of over 2,000 volumes, which have been maintained separately under the name of the Loganian Library. Among his works are *Experimenta de Plantarum Generatione,* and a translation of Cicero's *De Senectute,* printed by Benjamin Franklin, and which contains notes and a preface by him.

Logan, John Alexander (1826 - 1886), an American soldier and politician. He was a native of Jackson County, Illinois. He served as a volunteer in the Mexican War, becoming lieutenant in the First Illinois infantry. After the war he studied law, graduating from the law department of the University of Louisville, Kentucky in 1851. In 1852, and again in 1856 he was elected to the Illinois legislature. In 1858 he was sent to Congress, and again in 1860, but the following year gave up his seat to become colonel of the Thirty-first Illinois infantry. In 1862 he was promoted, first to the position of brigadier-general, and then to that of major-general of volunteers. He was made military governor of Vicksburg upon the capture of that city. In 1863 he became commander of the Fifteenth Corps, and later commanded, for a time, the Army of the Tennessee. In 1866 he went to Congress as a Republican, and representative from Illinois, and in 1871 was elected to the Senate, to which he was again elected in 1879. In June 1884, at the Republican Convention at Chicago, he was a candidate for nomination for the presidency which Blaine won, whereupon Logan was nominated for vice-president by acclamation. He wrote *The Great Conspiracy,* and *The Volunteer Soldiers of America.* There is erected to the memory of General Logan in Grant park, Chicago, a fine equestrian statue, the work of the celebrated St. Gaudens.

Logan, Utah, the county seat of Cache County, is situated on the Logan River at the head of a fertile valley watered from the Wasatch Mountains and is sixty-nine miles north of Ogden. The city is an important commercial center for a large section including northern Utah and southern Idaho. It is served by the Oregon Short Line Railroad and an interurban line. The principal articles of commerce are horses, cattle and sheep, and wheat, sugar beets, alfalfa and fruit. Milk condenseries, beet sugar refineries, knitting mills and flour mills are the chief industrial plants. Logan contains, besides its public schools, the Utah Agricultural College, New Jersey Academy, Brigham Young College and a Carnegie library. Population, 1920, 9,439.

Logan, Mount, after Mount McKinley the loftiest peak in North America, is in the northwest corner of Yukon Territory, and is the highest mountain in Canada, 19,539 feet above sea level. The peak is a part of the range known as the Saint Elias Mountains, which takes its name from Mount Saint Elias, situated a few miles southwest of Mount Logan. Until the error was corrected in 1898, Mount Logan was believed to be the highest peak in North America. The Seward Glacier, more than fifty miles long, descends from the southern slopes of the mountain and extends into Alaska. Mount Logan was named for Sir William E. Logan (1798-1875), the first director of the Canadian Geological Survey.

Loganberry, a delicious and commercially important berry produced by a cross between a wild California blackberry and a red raspberry. It was developed at Santa Cruz, California, in 1881, by Judge J. H. Logan, whose name it bears. The loganberry is shaped like a large blackberry, but is a rich, dark red in color; the taste is similar to that of the blackberry. Since 1893 the berry has been extensively cultivated in the United States and the more temperate parts of Europe. Loganberries, if given proper winter protection will thrive as far north as southern Canada.

Logansport, Ind., an industrial city and the county seat of Cass County, is 77 miles northwest of Indianapolis, at the confluence of the Wabash and the Eel rivers, and on several important railroads. The Pittsburgh, Cincinnati, Chicago & St. Louis and the Vandalia railroads maintain

extensive shops here. Logansport is the trading center for a rich agricultural region, and in its industrial plants are produced automobiles, fire extinguishers, lumber, plows, flour, foundry products, soap, baskets, brooms and other articles. Manufacture is aided by good water power. The Northern Indiana Hospital for the Insane, with more than 30 buildings and a 300-acre farm, is located here. A fine library, several parks, five public playgrounds and modern schools add to the attractiveness of the city. The water works and electric light plant are municipally owned. Population in 1920, 21,626.

Loggia, an Italian word, used to designate any roofed structure, one or more sides of which are open to the weather. It is applied to such well known buildings as the Loggia of the Vatican, the Loggia del Bigallo at Florence, the Loggia dei Nobili, the Loggia del Papa, the last two being at Siena, the Loggia dei Banchieri at Genoa, the veranda of the Farnesina at Rome by Peruzzi, etc. The American meaning of the word implies any structure open to the weather on one side.

Logarithms, lŏg'a-rĭthms. See NAPIER.

Logic, lŏj'ĭk, the art of reasoning. Logic enables the student to distinguish between true and false argument. There are many forms of reasoning. One of the simplest is the following:

1. Adams County is a part of Ohio.
2. West Union is a part of Adams County.
3. West Union is a part of Ohio.

Such a form is called a syllogism. The first statement is called the major premise; the second, the minor premise; the third, the conclusion. If the premises be true, the conclusion must be true. This sort of reasoning is employed largely in geometry, as:

1. The opposite sides of a parallelogram are equal.
2. This figure is a parallelogram.
3. Its opposite sides are equal.

In argument of this sort, liability to error lies chiefly in assuming a false major premise. In the days preceding the American Revolution the British authorities argued as follows:

1. All subjects should pay taxes.
2. The American colonists are subjects.
3. They should pay taxes.

The American colonists argued as follows:

1. Only represented subjects should pay taxes.
2. We are not represented.
3. We should not pay taxes.

So far as the form of argument is concerned, both syllogisms are correct. The different conclusions drawn are due to starting from contradictory major premises.

The early colonists of Virginia sent back their vessels to England loaded down with iron pyrites, or fool's gold. Thrown into a syllogism, their argument was as follows:

1. Gold is yellow.
2. This metal is yellow.
3. This metal is gold.

In their syllogisms, both premises are true, but the conclusion does not follow from the premises. It is not true. The metal was not gold.

In his unique poem of *The Deacon's Masterpiece, or The Wonderful One-Hoss Shay,* Dr. Holmes presents two syllogisms, the deacon's and his own. Both are fallacies. The reader may decide whether the fallacies lie in the premises or in the conclusions. The deacon's syllogism is as follows:

1. A shay wears out in its weakest spot.
2. My shay shall have no weakest spot.
3. My shay will not wear out.

Holmes's syllogism is the following:

1. All chaises wear out.
2. This chaise had no weak spot.
3. All parts wore out at once.

As may be remembered, he leaves the argument with "Logic is logic. That's all I say."

In syllogistic argument, we proceed from general statements to a definite one. From "All men are mortal," and "Enoch is a man," the syllogistic logician argues that "Enoch must die." This form of argument is called deduction. Turned end for end, the argument runs, "Enoch died, Columbus died, George Washington died, a million other men have died, hence all men die." In other words, man is mortal. This is called inductive reasoning.

The latter is the form employed usually by scientists. When a wheat buyer sends a man to draw a few ounces of wheat from

different parts of a car and puts them together as a sample, he infers by inductive reasoning the kind and quality of wheat contained in the car. The more samples he has from the car, the more certain his conclusion. The directors of the United States census have observed that, for the past hundred years or more, the center of population has moved steadily westward from a point near the Atlantic coast to a point in 1900, near the city of Columbus, Indiana. We are justified by induction in concluding that the census of 1910 will locate the center still nearer Indianapolis.

This sort of reasoning is open to error. Although we may have seen half the beans in a bag, we cannot be certain that all the beans are sound until we have examined the last one. The more instances we observe, the more certain our conclusion. The early settlers of Minnesota had so many failures and disappointments that they jumped at the conclusion that corn and apples could not be raised in the state. Persistent efforts and a later trial of varieties better adapted to the climate have demonstrated that the logic of the pioneers was utterly at fault.

Far from being restricted to the college and the school, it may be said, as of no other subject, that logic, whether deductive or inductive, is but the application of shrewd common sense. Many of our popular sayings are logical conclusions of the shrewdest sort:

Where there is so much smoke, there must be some fire.

Experience keeps a dear school; fools learn in no other.

Light heel'd mothers make leaden heel'd daughters.

He that by the plow would thrive,
Himself must either hold or drive.

Logomachy, lō-gŏm′a-kĭ, a word contest, or war of words. As most commonly used, logomachy is a popular game played with small squares of pasteboard, each bearing a letter on one side. The larger the supply of letters, the greater the number who can play at the game. The letters are turned wrong side up. The first player draws a letter and turns it right side up on the table to start the "pool;" the next player draws and adds his letter to the pool. The first player who can form a word with the letters drawn does so and places his word in front of him on the table in plain sight of all. The players continue to draw and form words, each having the right to take a word from another player provided he uses every letter in it to form a new word and adds to it the letter he draws, a letter or letters from the pool, or all the letters in any other word on the table. The "game" may be any number of words, as ten. Or the players may agree on playing a given length of time, that player winning who has the greatest number of words when the time is up.

Fixed rules are necessary, the first of which must be the selection of a dictionary as authority on the correctness of any word that may be challenged. If a player is challenged and proved at fault, he loses his play. Rules as to allowing plurals, participial forms, proper names, etc., must be agreed upon and should be less rigid when children and inexperienced persons are playing. In general a word should not be permitted which involves a very slight change only, as a plural formed by the addition of the letter "s."

Logrolling, a system of giving help. In clearing up the heavily timbered portions of the country each settler was accustomed to work independently during the winter. He felled trees and piled up the brush and small branches himself, but cut the trunks into lengths and left them lying on the ground. In the spring the men of the settlement combined with their teams and helped each other to draw these large logs together and to roll them up into heaps to be burned. Each settler invited his neighbors to his "logrolling" and made it a day of general jollification. No account was kept of whether one gave more help than he received. Everybody was expected to turn out to a logrolling. Of late, the term has been applied to legislative matters. A member having a bill in charge, possibly an objectionable one, which he is unable to have carried by his own efforts, invites other legislators to assist him in putting his measure through, with the understanding that he will turn out and help them "logroll" their pet bills when the time comes. While carried on under the guise of good fellowship, and not subject to the charge of brib-

ery, logrolling is really one of the most dangerous features of modern legislation.

Logwood, a tree of the locust family found in many parts of the West Indies and Central America, especially Honduras. It grows from twenty to forty feet in height and has crooked, thorny branches. Its wood is heavy and sinks in water. It is of a red color. When the chips are boiled in water they yield a rich brown dye, much used for coloring cotton and wool. The wood was formerly imported in logs, whence the name. See LOCUST; DYE STUFFS.

Lohengrin, lō′ĕn-grĭn, in German legend, the knight of the swan. He was the son of Parzival. Lohengrin is taken to Antwerp in a boat drawn by a swan. Here he weds a princess on condition that she shall never ask his name. She breaks her word and Lohengrin is borne away by the swan. The poem *Parzival,* written early in the thirteenth century by Eschenbach, mentions Lohengrin. In the latter half of the same century a poem called *Schwanritter* (Knight of the Swan) telling the story of Lohengrin, was written by Konrad von Wurzburg. Still another poem recounting the same legend was written in 1290 by an unknown Bavarian author. Wagner used the story as the subject for his great opera, *Lohengrin.*

Loire, the largest river of France. It rises in eastern France, 4,500 feet above the sea level, and flows westward, 626 miles, under the walls of Nevers, Orleans, Tours, and Nantes, into the Bay of Biscay. It is navigable by large steamers to Nantes, thirty-three miles from the sea. Smaller boats ascend another 500 miles. The basin of the Loire includes 44,979 square miles. At one point, the Loire and the Seine, like our Cumberland and Tennessee, flow side by side. The footpath from the Seine to the Loire is but seven miles in length.

Loki, or **Loke,** lō′ke, in Scandinavian mythology, the god of strife and destruction. He was the personification of fire and was thus of a twofold nature, performing now good, now evil deeds. He was a handsome fellow, but his disposition was evil. While he was a companion of the gods and sometimes friendly, he was at heart their enemy. He was the son of Farbauti, whose duty it was to ferry souls across the rivers in the land of the dead. Loki had three children, the Midgard-serpent, the Fenris-wolf, and Hela. At the creation, Loki's part was to give blood to man. Loki caused the death of Baldur, the Good. At last the gods chained Loki and set a serpent to guard him. The serpent would have let fall drops of poison upon his face had not his wife held a bowl to catch the poison. At Ragnarok, Loki was freed, but he and Heimdal fought and both were slain.

> That Loke represents fire in its various forms becomes clearer with every new fact, every new event in his life. . . . That Loke symbolizes fire is also illustrated by the fact that the common people in Norway, when they hear the fire crackling, say that Loke is whipping his children. . When the sun draws water, they say that Loke is drinking water.—Anderson.

Lokman, lok-män′, the reputed author of a collection of fables in Arabic. He has been represented variously as a nephew of Job, a king, a tailor, a carpenter, a shepherd, and an Ethiopian slave. A tale is told of his master offering him fruit of intense bitterness. Lokman ate it without a grimace. Asked how he could do so, he replied that he had received so many benefits from his master that he could not show dislike for the only unpleasant gift he had ever had at his hand. The answer so pleased the master that he gave Lokman his liberty. Whether an authentic Lokman lived is not known. The fables resemble those of Greece and India. They were put into their present form in the thirteenth century.

Lollards, English followers of John Wyclif. The Oxford reformer inspired a force of disciples who traveled up and down the land denouncing wrongdoing in church and state. Those who had enough to eat and dressed in fine raiment, and who wagged their heads at poverty-stricken preachers preaching to poverty-stricken peasants, called them Lollards, a term meaning "babblers." The Lollards were not wholly religious reformers. The rising under Wat the Tyler in 1381 reveals social conditions which made the doctrines of the Lollards popular.

In its widest sense, Lollardy was a democratic protest of the downtrodden poor against the oppressive rich, both in church and in state. Preachers like John Ball and

other "babbling preachers" spread the gospel of discontent. The miserable peasants who had but emerged from villeinage were not alone in deeming that affairs were awry. Oxford University and many nobles, some it must be owned for political purposes, aided the "poor priests" who went about preaching to the crowds. Not a few noblemen had Lollard chaplains. The ferment of social betterment spread so rapidly during the ten years following Wyclif's death that one of the bitterest adherents of the old order declared that every second man in England was a Lollard.

Piers Plowman's Creed was written about this time. It draws a "portrait of the fat friar with his double chin shaking about, as big as a goose's egg, and the plowman with his hood full of holes, his mittens made of patches, and his poor wife going barefoot on the ice so that her blood followed." The strife between the adherents of the red rose and the white rose favored the spread of Lollardism. In 1399 Henry IV, the Lancastrian, secured the throne. The Lollards claimed that he was aided by the Church as the reward of an agreement to put down Lollardy. Whatever the fact may be, it is certain that Henry and the Archbishop of Canterbury, in pursuance of an act for the burning of heretics, united the forces of church and state to purge the land of a troublesome political and religious heresy. Oxford was regulated. Preachers were banished, imprisoned, and burned. Sir John Oldcastle and his chaplain were burned at the stake. Wyclif's Bible and heretical pamphlets were hunted down. Lollards no longer preached by the wayside, but held forth in secret "in peasants' huts, in sawpits, and in field ditches." A prominent feature of these meetings was readings from hidden copies of Wyclif's Bible.

Though Lollardism persisted under cover until merged in the English Reformation, it was so far suppressed that all prospect of a Lollard sect was averted. Much has been written on the effect of Lollard writings on England and the relation of the English Lollards to the followers of John Huss in Bohemia.

Lombard Street, a short street in London, so called from having been the residence of the Lombard money changers of an early day. Their extortionate rates of interest caused their expulsion by the government of Queen Elizabeth. The street is still the street of the bankers, corresponding in this respect to Wall Street of New York. It is but a step from Lombard Street to the Bank of England.

Lombards, a Germanic people. In the sixth century they shifted from the valley of the Elbe and established themselves in northern Italy, giving their name to the kingdom of Lombardy. At one time the Lombards overran nearly all Italy. Charlemagne overthrew their kingdom and caused the "iron crown" of their kings to be set on his own head. Lombardy was later parceled out into duchies and republics of varying fortunes, chiefly under Austrian or other foreign domination, until, in 1860, the last of them was consolidated with the kingdom of modern Italy. The percentage of Teutonic blood is small. It is probable that the Lombards never formed a large percentage of the population. They were soon absorbed. In London, the foreign merchants, especially those from Italy, were known as Lombards. See LOMBARD STREET. Our Lombardy poplar derives its name from the Kingdom of the Lombards. The "iron crown" of the Lombards was a broad band of gold set with jewels. It took its name from a fillet or strip of iron running around with the golden band. This iron was reputed to have been wrought from a nail of the cross. The crown is now preserved in the church of Monza, a small town of northern Italy.

Lombroso, Cesare, chā'zā-rĕ lōm-brō'-zō (1836-1909), an Italian scientist. He was born at Verona and died at Turin. His name is connected with the most thorough investigations that have been made of the abnormal human being. Lombroso is noted especially for his studies on the causes of crime, his theory being that a criminal should be treated as a diseased person, and as such may, in some cases at least, be cured. While his theories have not been accepted entirely as yet, they have had a radical effect upon the old-time conception of the criminal. In 1862 Lombroso was made professor of psychiatry, that is, the study and treatment of mental diseases, at Pavia, and

later become professor of medical jurisprudence and psychiatry at Turin. He published several books setting forth his views. *The Criminal, The Man of Genius, The Anarchists,* and *The Causes of, and Contest Against, Crime* are among them. Lombroso has taken an interest in the work of the Society for Psychical Research, and has been associated with other scientific men in investigating various psychic phenomena. Recognized as an authority on psychology, his opinions, had he reached definite conclusions, would have great weight. Like many others, however, Lombroso satisfied himself as to the genuineness of the phenomena, but failed to find for them any adequate explanation.

Lombroso was a short, heavy, ill proportioned man, kind-hearted, but absent-minded and visionary. He would give to all who asked of him, and would have been penniless but for his wife. He was utterly regardless of dress, his wife running after him often, when he started for the university, to see that he wore a necktie or to take him his overcoat. His whole mind was given to his work. Whether his theories meet with general acceptance or not, their effect has been to awaken an interest in studying the causes that lead to crime, and in attempting to cure rather than to punish the criminal.

See PSYCHICAL RESEARCH.

Lomond, lō′mond, **Loch,** a Scottish lake, the largest in Great Britain. It lies northward from Glasgow twenty miles. It is almost twenty-five miles in length and from one and a half to seven miles in width. The greatest depth is sixty feet. Ben Lomond, on the eastern shore, the southernmost spur of the Grampians, rises from the water's edge to a height of 3,192 feet. The waters are beautifully clear and are studded with green islands. Salmon, trout, pike, perch, and fresh water herrings are taken in season. Loch Lomond, Loch Katrine, and the Trossachs lie in the traditional course followed by tourists on the way from Glasgow to Edinburgh or the reverse. Loch Lomond is a favorite fishing ground for trout. The hotels keep a record of catches.

See HIGHLAND; SCOTLAND.

London, Jack (1876-1916), an American author. He was born in San Francisco and was of an adventurous nature. At seventeen he became a seaman, visiting Japan and the Bering Sea. Partly to gather data for a series of articles, he tramped through Canada and the United States. A period of study at the University of California was interrupted by the Klondike rush of 1897. He was a newspaper correspondent during the Russo-Japanese War and also in Mexico in 1914.

His home was at Glen Ellen, a village forty miles north of San Francisco. Mr. London died unexpectedly and during his sleep, November 27, 1916. In accord with a desire long known, his body was cremated and the urn containing the ashes was buried in a patch of unkept timber. There is no monument. A rough, unmarked granite boulder lies over the spot.

His stories were usually written for periodicals and later published in book form. they relate mostly to adventure and every page exhibits the author's independent spirit.

London, the capital of the United Kingdom and of the British Empire. The name is British, that is to say, Welsh—not English. It means "Pool Hill," having reference to a widening in the Thames convenient for ships, and to a hill, whether the site of the Tower or of St. Paul's Cathedral is uncertain. In the day of the Britons London was but a hamlet of huts—a dry spot among the marshes of the Thames—a suitable place for landing and camping. It is now the most extensive, the most populous, the wealthiest, and the most influential city in the world.

Londinium, as they called it, was occupied by the Romans 43 A. D. York was their British capital, but London was an important camp—a landing place for Watling Street. In the time of Nero it was a celebrated resort of merchants and a center of shipping. The London of Constantine extended from the Tower along the Thames westward about a mile. It was inclosed by a wall, the gates of which are still commemorated by streets. Lud-gate, Postern-gate, Bishop's-gate, Moor-gate, Cripple-gate, Alder's-gate, and New-gate mark the location, it is believed, of Roman entrances. Excavations for foundations still bring up antiquities, burial caskets, statues, bits of pavement, terra cotta ornaments, lamps,

vases, dishes, goblets, trinkets, spoons, needles, pins, etc., dating from the time of Roman occupation.

The original London—the Old London of Wat Tyler and Jack Cade, the London of fires, famines, and pestilence, the London from which John Gilpin set out on his famous ride—is still known as "The City." It lay, as described, on the left bank of the river at the head of deep water navigation. It is still the very heart of London. It contains St. Paul's Cathedral, the bank of England, the Royal Exchange, Mansion House, Guildhall, Goldsmiths' Hall, Mercers' Hall, the Church of St. Mary-le-Bow, the Tower, the Inns of Court, and many other historic buildings. Its chief street, the Fleet, skirted formerly the edge of the Thames. "The City" is the financial center of London. In the daytime the offices are occupied by about a third of a million people; at night, the City is inhabited by not to exceed 30,000 permanent residents and watchmen. It is connected with the right bank of the river by famous London Bridge. Down the river from the City lies the East End, the region of docks and warehouses; while up the river lies the West End, the region of the Strand, the British Museum, Trafalgar Square, Westminster Abbey, the Houses of Parliament, the modern palaces, clubhouses, and great parks for which London is noted.

The modern municipality of London entirely surrounds the Old City. It lies on both sides of the Thames, occupying a territory about fourteen miles long by eight wide, and covering an area of about 122 square miles. The Thames is crossed by a score or more of bridges. London proper, or Metropolitan London, as it is called, had a population in 1921 of 4,483,249, being greater than that of either Scotland or Ireland. The figures for greater London are 7,476,168.

It is difficult to convey an adequate idea of the size of so great a city. More Scotch reside in London than in Edinburgh; more Irish than in Dublin; more Jews than in Palestine. There are thousands of streets, and their total length runs well into the thousands of miles. The old horse trams have disappeared from London, and the hansom cab is faring badly in competition with the taxicab. The total mileage of London tramways was 350 in 1921. It is estimated that during the busiest daily traffic periods at least 300 to 400 motor omnibuses pass certain points each hour. Approximately 75 per cent of the passenger carrying vehicles of London have been motorized.

Since 1921 London has had regular air service to the continent. In that year there were four daily services to Paris, and one each to Amsterdam and Brussels; and these make regular connection with similar services to other European points and to Africa. In that year the average number of passengers each week was 400.

There are three systems or circles of underground railways serving London, running through about seventy miles of tunnels or "tubes." Subway stations were turned to an entirely new use during the World War, when they were popular as shelters from the bombs of enemy aircraft raiding across the Channel.

The postal system of London is immense, but is highly efficient. There are eight postal districts, which are further subdivided into delivery office areas. The buildings of the General Post Office have lately been enlarged, and a special subway for the delivery of mail has been constructed. The local delivery offices of the system numbered 105 in 1921.

The city water is supplied from numerous sources—wells, springs, distant streams and the upper reaches of the Thames. At the close of 1920 the storage reservoirs for unfiltered water covered 2,000 acres, and in 1921 a reservoir with a capacity of 6,350,000,000 gallons was completed. During 1919-20, an average year, the average daily water supply was 273,400,000 gallons.

London public elementary schools numbered 950 in 1920, in which 854,979 pupils were enrolled. The London County Council is the local educational authority. The middle schools offer more extended courses of study than do the elementary schools; they are supported by corporations, societies, churches and endowments. Some of the endowed schools originated centuries ago, when London was

ST. PAUL'S CATHEDRAL

From a Photograph

much smaller than it now is. A noteworthy features of the free education system are the lectures of the University of London Extension, which are always well attended. London is not the educational center of the British Empire, but it is the scientific and literary center.

The London government, differing from that of any other city in the British Isles, is a system that has evolved in accordance with the needs of so great a city. The City of London has its own governing body, distinct in every detail from that of Greater London. The London County Council is the repository of authority over Greater London. Since 1918 the London County Council has consisted of 124 councillors and 20 aldermen.

During the World War the Germans made several air attacks upon London, but because of the fact that the raiders concentrated on industrial plants and equipment—railway terminals, munition factories, etc.—no old landmarks or works of art were destroyed. About 550 people were killed during these raids, and property valued at $10,000,000 was destroyed.

The markets of the city are not particularly attractive, but they are conducted on a scale that almost surpasses belief. A vast amount of peddling is carried on by means of pushcarts. Billingsgate market is famous for fish; Leadenhall market, for poultry and game; Smithfield, for fresh meats; Covent garden, for vegetables, fruit, and especially for flowers and house plants.

The greater part of the city is unattractive in appearance. It is a vast sea of dingy, blackened, grimy, brick buildings. Coal is depended upon for fuel. A heavy dark pall hangs over the city the greater part of the time. Lately, however, the use of oil as fuel has somewhat relieved this condition. Also it has been suggested that power and heat for the entire city be supplied by electricity—developed in the Midland coal fields. If the project proves feasible, it will solve the smoke problem. In early winter, a heavy fog is likely to roll up from the sea, making street traffic almost impossible. There are on an average, 1,326 hours of sunshine yearly. The temperature is, on the whole, equable. The greatest extremes known are 20° and 81°. The annual rainfall is about 25 inches, New York has 44.

No city in the world presents greater contrasts. The poorer sections are indescribably squalid and dirty. The men are drunken; the women are slatternly and tipsy; the children are poorly clad and poorly fed. They live from hand to mouth. The men work in the docks when work is to be had; the women go out to service; the children are required by law to attend school. Truant officers see that they do. At night the parents return with a shilling or two, which they spend for a day's rent, a little coal, or some food. Too often the greater part goes for gin. Heroic efforts have been made to mend the condition of the London poor. Entire quarters formerly occupied by reeking, filthy rookeries, have been torn down by authority of Parliament and replaced by respectable tenements in which the humblest wage earners may find shelter and bathing privileges at nominal cost. Public schools have been established throughout the entire city. Even yet, so great is the destitution and want of foresight among the poorer people, that thousands of children come to school too feeble and too hungry to work until they have been marched down into the basement and given a bowl of soup and a piece of bread.

The eastern part of the city is the home of the greatest misery. In the western end there are spacious parks, squares adorned with monuments and statuary, and streets of spacious marble mansions. Lackeys, carriages, the finest motor cars, furs, laces, and silks give an impression of unbounded wealth. Between the two sections lies the great London of commerce and finance. The roar of traffic and the hurry of business on the Strand, the Fleet, and adjacent streets is unequaled.

London is a manufacturing city of importance. It is the largest brewing, distilling, and sugar refining center in the world. There are extensive manufactures of silk, metal goods of all kinds, plated ware, jewelry, watches, brass work, hats, furniture, and carriages. The making of cloth, boots and shoes, and millinery centers largely in London. The enormous shipping interests have built up manufactures of

ropes, masts, sails, and all sorts of ship supplies. Soaps and dyes are made on a large scale. The annual production of books, periodicals, and papers exceeds that of any other city in the world.

It goes without saying that London is the greatest port in the world. The Thames from the Bridge of London downward for twenty miles is one vast port. Counting fishing boats, sailing vessels, steamers and all, it may be said that a ship arrives from some part of the world every minute of the day and night. Enormous docks have been excavated along the banks of the Thames. They are surrounded by wharves, sheds, vaults, and warehouses of vast dimensions. St. Catherine's docks occupy an area of twenty-four acres. London docks, lying farther to the east, cost $20,000,000, and cover one hundred twenty acres. The tobacco dock alone covers an area of five acres. A kiln and tall chimney in which officials destroy adulterated goods, when found, is known as the "Queen's Tobacco Pipe." The East India docks and the West India docks receive the imports from these regions. Albert dock, finished in 1880, admits ships drawing thirty feet of water. Ships enter through gates at high tide. The gates are closed before the tide goes out. Though the water in the river sinks until the Thames is reduced to a dirty ditch, the ships ride safely in the docks and discharge their cargoes or take on goods for foreign ports. Of a busy day thousands of men are employed carrying goods in a single dock. They are a sorry-looking lot. They are admitted at the city gate in the morning in the order of "First come, first served." They work all day, possibly without food. At night, they clutch a few pennies and go back to the city. Some take their money to their families; others spend it for food and liquor and sleep in the gutter or in doorways. In the morning they are back again in an army besieging the gates for work. The war disturbed London's trade life, but in an average year the tonnage that enters and clears the port approximates 22,000,000. In 1919 the trade of the port reached the greatest value in its history, roughly $5,000,000,000, Aside from slight charges for dock privileges, and with the exception of a few articles, the ships of any nation with which the United Kingdom is at peace may land goods at the London docks and reload without paying custom duties.

It is out of the question to give an adequate idea of the crowding and the roar of London. As Dr. Holmes remarks, "the great sight of London is London." The reader who is interested in the mock auctions, pickpockets, thieves, coffeehouses, curio shops, street scenes, and types of humanity to be met in London may find them described in Dickens' pages. *Oliver Twist, Old Curiosity Shop,* and *Dombey and Son* are excellent reading. They describe London as it was seen by Dickens fifty years ago and are not yet out of date.

A noted writer sums up London as follows: "London sits enthroned at the gates of the sea, the mighty center, commercial, financial, political, social, and intellectual, of a vast realm, where English laws, English institutions, the English tongue, and all the treasures of English literature reign and govern and enrich the lives and the minds of millions of men, generation after generation, all over the globe, with a sovereignty that seems imperishable and destined never to pass away."

See special articles on ST. PAUL'S CATHEDRAL; BANK OF ENGLAND; LONDON BRIDGE; BILLINGSGATE; THAMES; LONDON TOWER; CLEOPATRA'S NEEDLE; CHARING CROSS; HOUSE OF PARLIAMENT; WESTMINSTER ABBEY; PALL MALL; PICCADILLY; BRITISH MUSEUM; SLOANE; HYDE PARK; KENSINGTON; CRYSTAL PALACE; WINDSOR; KEW; LLOYD'S; SCOTLAND YARD; SPURGEON; DERBY; CLUB; FIRES; ST. JAMES; INNS OF COURT; CHARING CROSS; CHELSEA; HAMPTON COURT; WATLING; BOADICEA; GREENWICH, etc.

London, Ontario, a port of entry and the county town of Middlesex County, is situated on the Thames River, 115 miles southwest of Toronto, on the Canadian Pacific, Pere Marquette, Canadian National, and the Michigan Central and London & Port Stanley railroads, the latter owned by the city. The city's harbor is on Lake Erie. Because of the facilities for trans-

portation by water and rail, London has enjoyed a rapid growth since it was founded in 1826, and is now an important commercial and industrial center. There are about four hundred factories, producing such varied articles as iron and steel, leather, chemicals, paper boxes, candies, boilers, hosiery, wearing apparel, furniture, agricultural implements and machinery, engines, and many others.

London is the seat of an Anglican and a Roman Catholic Bishop. The educational system is good, comprising public primary and high schools, an industrial school, Western University, Huron College, Saint Peter's Seminary and the Normal School. There is an insane asylum and three hospitals, an orphanage and a home for the aged. The most notable buildings in London are the Masonic Temple, custom house, Y. M. C. A., post office, the armories, the city hall and Wolseley Barracks. In 1921 London had a population of 60,959.

London Bridge, the earliest bridge across the Thames at London. It is situated about a half a mile above the Tower. The first bridge was built of wood. It was carried away by a storm and high tide November 16, 1091. The first stone bridge was built a century later. A roadway of 20 stone arches rested on wooden piling. It was 45 feet wide, 926 feet long and rose 60 feet above water. A row of shops, stalls, and houses sprang up on each side of the roadway, until the bridge became a continuous street from shore to shore. It was terminated at each shore by gates, on the pinnacles of which the heads of traitors were exposed to public view.

This is the London Bridge of history and literature. In the reign of Queen Elizabeth, Sir John Hewitt, Lord Mayor, dwelt on the Bridge. His daughter fell into the river and was rescued by Edward Osborne, an apprentice. Of course the fortunate youth married the daughter and thereby laid the foundation of his fortune, becoming later the Duke of Leeds. This bridge was for centuries the only bridge across the Thames. Others, as the Blackfriars, Waterloo, Battersea, Albert, Chelsea, and Southwark, have been built since. In 1831 the present London Bridge was opened. It lies half a block above the old one. It was designed by John Rennie, a Scotch engineer. It is fifty-four feet wide and 928 feet long. It is carried on five granite arches. That of the center is 153 feet in span. It cost upward of $10,000,000. The lamp posts were cast from cannon captured in the peninsular war. The old bridge was pulled down in 1832.

London Bridge is a busy place. It is the most frequented bridge in the world. On week days 100,000 pedestrians and 20,000 vehicles cross daily. Heavy drays keep to the center. Lighter carts and carriages keep nearer the sides. At intervals there are recesses in the coping in which pedestrians may stand out of the way and watch the stream of humanity as it pours by. Looking over the coping one may see busy river craft darting through the arches of the bridge. The Thames immediately below the Bridge deepens into what is known as the Pool, which is at all times a veritable forest of masts.

See BRIDGE.

London Company, a company of merchants and others dwelling in and near London. It was chartered in 1606. The members had perhaps large ideas and large expectations of empire. It founded a colony at Jamestown in 1607 and was dissolved in 1624.

Londonderry, the chief city and port of the county of Ulster in north Ireland. The population is about 40,000. The city is at the head of Loch Foyle, twenty-three miles from the sea. A tender runs down the bay to connect with the Glasgow ocean liners for America. The center of the city is still surrounded by a wall. Seven gates give access. The harbor is safe for large ships and is the seat of an important trade with Scotland, England, and parts of Ireland. In British history Londonderry is celebrated as the center of the Scotch-Irish. In 1689 the men of Ulster successfully defended the city against James II from April to August. The present population is equally divided between Protestant and Catholic. The latter completed a superb cathedral in 1873.

Long, John Luther (1861-), an American author whose *Madame Butterfly,* upon

which Belasco's play and Puccini's opera of the same name are founded, is the best known of his works. Mr. Long was born in Pennsylvania, and after studying law in Philadelphia was there admitted to the bar. His first book, the one mentioned above, was published in 1898 and won immediate attention. Mr. Long did not give up his legal practice, however, even after he had written several books. He is the author of *Miss Cherry Blossom of Tokio, The Fox Woman;* of the plays, *Betty Martingale*, written for Mrs. Fiske, and *Kassa,* written for Mrs. Leslie Carter; and of the operas, *Andon* (with Mr. Leps) and *Hosni-San* (with same).

Long, Stephen Harriman (1784-1864), an American engineer and explorer, was born at Hopkinton, N. H. He graduated from Dartmouth College in 1809, and for a time taught school. In 1814 he was commissioned second lieutenant in the engineering corps of the army, was assistant professor of mathematics at the United States Military Academy, and later was brevetted major. Long made a survey of the Mississippi and its branches and also led an expedition from the Mississippi to the Rocky Mountains, a high peak of this range bearing his name. He was an authority on bridge building, and the first to suggest a rectangular frame for bridges. He also did much work towards improving rivers and harbors. In 1861 he was made chief of topographical engineers with rank of colonel, retiring from the army in 1863. Long made several expeditions, among them one to the source of St. Peter's River, also expeditions to Lake Winnipeck, Lake of the Woods, etc. He also surveyed other sections of the United States on behalf of the government. His *Railroad Manual,* published in 1829 was the first work of this sort published in the United States.

Long, William Joseph (1866-), an American clergyman and author. He was born at North Attleboro, Massachusetts. He is a graduate of Harvard and of the Andover Theological Seminary. His books have to do with animal life. The author is particularly gifted in making real personalities of the animals whose history and habits he presents. *Ways of Wood Folk, Wilderness Ways, Secrets of the Woods, Fowls of the Air, Beasts of the Field,* and *School of the Woods,* are all entertaining and instructive reading. Though criticized by John Burroughs and Theodore Roosevelt, no stories of animals have been written which are more successful in inspiring young people with sympathy for animals and a desire to study them at first hand.

Long Beach, California, twenty miles south of Los Angeles, in Los Angeles County, is a favorite resort for pleasure seekers, and is also an important commercial city. It is served by numerous electric railways, by the Southern Pacific and other railroads, and has a steamer connection with Santa Catalina Island and other points on the coast. Long Beach has one of the finest beaches on the Pacific Coast. There is an auditorium, a large pleasure pier, and numerous handsome public buildings. The city trades extensively in grain, lumber, fruit and produce from the rich land a few miles inward from the ocean. In 1920 the population was 55,593.

Long Branch, N. J., forty-five miles by rail south of New York City, is one of the oldest seaside summer resorts in the United States. In 1734 it was an Indian fishing village, and was later a plot of ground owned by a British officer. After the Revolutionary War it was confiscated by the government and later developed into a bathing resort. The city is served by the Pennsylvania and the Central of New Jersey railroads and by interurban electric lines, as well as by numerous lines of boats. While chiefly a residential and resort city, Long Branch maintains several establishments for the manufacture of various knit articles of apparel. Ocean Park, Ocean Avenue, extending for several miles along the bluff overlooking the Atlantic, and the boardwalk, are especially attractive features. Long Branch has a fine public school system, a library, and a handsome Federal building. In 1920 the population was 13,521.

Long Island, an island of New York state lying to the eastward from New York harbor. It has an extreme length of 120 miles and is from twelve to twenty-three miles wide. It is reached from New York

by the Suspension Bridge and other bridges, also ferries and tubes. The island is divided into four counties. The eastern portion is wooded and is held by wealthy men as a game preserve. The soil is productive and is tilled closely. The hay, fruit, and vegetables are grown for the city market. Oyster, clam, and other fisheries employ many persons. Surburban villages, as Oyster Bay, the residence of President Roosevelt, are extending farther and farther into the country and along the shores. These suburbs and towns are famous for tennis courts, golf links, and clubhouses. See BROOKLYN.

Long Parliament, in English history the Puritan Parliament that met November 3, 1640 at the summons of Charles I. It was the parliament that carried on the Civil War. Due to the campaigning efforts of John Pym it was largely liberal and anti-royal in sentiment. It declared ship-money illegal, claimed the right of taxation to belong only to the Commons and not to the Crown, passed the Triennial Bill, and put Laud in prison and Strafford to death. In November 1641 it adopted what was called the Great Remonstrance and in January 1642 brought on the Civil War by refusing to obey the royal order to surrender its leaders, Hampden, Pym, Hollis, Haselrigg and Strode. Many members were lost upon the introduction of Presbyterianism and in December 1648 nearly a hundred more were "purged" from the Parliament. This is sometimes referred to as "Pride's Purge."

The House of Lords was then abolished and "The High Court of Justice" appointed that tried Charles I and put him to death.

The small number of members left after Pride's Purge composed the "Rump Parliament" which was in nominal power until dissolved by Cromwell in 1653 by force of arms. After the death of Cromwell it reassembled in 1659 and arranged the recall of Charles II. It dissolved in 1660. See PARLIAMENT, CROMWELL.

Longfellow, Henry Wadsworth (1807-1882), an eminent American poet. He was born at Portland, Maine, February 27, 1807. His father was the leading lawyer of the city. The Longfellow house in which the poet was born is a square three-storied house with a hip roof. It was then one of the aristocratic dwellings of the city but it is now in a tenement district. Longfellow entered Bowdoin College when only fourteen and was graduated in due course. Hawthorne was a classmate, and Franklin Pierce was in the preceding class.

At graduation, Bowdoin offered Longfellow a professorship of modern languages, with permission to go abroad and prepare for the position. He spent four years traveling and studying in Italy, Spain, and France. A volume of travels entitled *Outre-Mer,* meaning Over Sea, gives a delightful account of his rambles and student experience. It reminds the reader of Irving's *Sketch Book,* by which it was very possibly suggested. Like Irving, Longfellow did much to interest Americans in the castles, cathedrals, old towns, and culture of Europe. In addition to modern languages he took an interest in early English. Hitherto Anglo-Saxon had been regarded as a curiosity, ranking with the Icelandic possibly, but Longfellow showed that our own literature has grown out of the rude poems of our Anglo-Saxon ancestors. When he took up his college duties in 1829, Longfellow was, without doubt, the most proficient American scholar in his particular line. In 1834 he was called to a similar professorship at Harvard University. After a second trip abroad, lasting a year and a half, he assumed the duties of his new position. He took up his abode in the house at Cambridge used by Washington as headquarters. Still

> Somewhat back from the village street
> Stands the old-fashioned country seat.
> Across its antique portico
> Tall poplar-trees their shadows throw.

Here he continued to reside for the rest of his life. It is now known as the Longfellow House. In 1839 he wrote *Hyperion,* a novel into which he weaves much of his own life. Longfellow was twice married. He resigned his professorship in 1854 and gave himself entirely to literature.

Longfellow began to write poetry when only thirteen years of age. A little volume of miscellaneous poems selected from the *United States Literary Gazette,* published when he was eighteen years of age, contains fourteen poems bearing his name.

Longfellow goes by many names. He is called "The Children's Poet." His poems

best adapted to children are, first of all, *The Children's Hour,* and *The Village Blacksmith.* One of the pleasant events of the poet's life was the presentation of a richly carved chair by the children of Cambridge on the anniversary of his seventy-second birthday. It was made of the wood of the "spreading chestnut tree" under which the village smithy stood. *The Old Clock on the Stairs, The Arrow and the Song, The Skeleton in Armor,* and *The Wreck of the Hesperus* are favorite selections found in school readers. *The Rainy Day* was written at a time of sorrow. *The Bridge,* referring to the bridge across the Charles River between Boston and Cambridge, has been set to music. *The Psalm of Life* is probably quoted more frequently than any other of his poems. It has been called a "cheap jingle," something that cannot be said of *The Day is Done.*

The day is done, and the darkness
Falls from the wings of Night,
As a feather is wafted downward
From an eagle in his flight.

Very many of Longfellow's poems are European in subject and treatment. Some of them are mere translations. Poe, who was very bitter against everything coming from New England, called Mr. Longfellow a "plagiarist," claiming that he simply stole from European sources. For all that, Longfellow is to the European mind a distinctive, and a great, if not the greatest, American poet. *Evangeline, Hiawatha,* and *Miles Standish* are cornerstones of this reputation.

Hawthorne gave him the anecdote of two Acadian lovers, parted on their marriage morn when the inhabitants were shipped away by the British authorities. "If you don't want this incident for a tale, let me have it for a poem," said Longfellow. This was the germ of *Evangeline.*

Still stands the forest primeval; but under the shade of its branches
Dwells another race, with other customs and language.
Only along the shore of the mournful and misty Atlantic
Linger a few Acadian peasants, whose fathers from exile
Wandered back to their native land to die in its bosom.
In the fisherman's cot the wheel and the loom are still busy;
Maidens still wear their Norman caps and their kirtles of homespun,
And by the evening fire repeat Evangeline's story,
While from its rocky caverns the deep-voiced, neighboring ocean
Speaks, and in accents disconsolate answers the wail of the forest.

No wonder the poet Holmes wrote him, "The story is beautiful in conception as in execution. I read it as I should have listened to some exquisite symphony, and closed the last leaf, leaving a little mark which showed a great deal more than all the ink I could have wasted upon the note you have just finished."

Hiawatha was published in 1855. It would seem that the subject of a great race occupying an entire continent, fading away before the whites like hoar frost before the sun, would be a grand theme for the poet's pen; and, indeed, many have attempted it; but Longfellow is the only writer who has succeeded in idealizing the American Indians in a poem of any length. The legends he obtained largely from the writings of Schoolcraft; the word painting of costumes, peace pipes, and the like, from the pictures of Catlin. The meter is that of an old heroic Finnish poem. The Land of the Ojibways is the northern peninsula of Michigan; Hiawatha is the legendary chief of the Ojibways; Minnehaha Falls is on the western bank of the Mississippi, a few miles below the Falls of St. Anthony; the pipestone quarry is located in extreme southwestern Minnesota, near the present town of Pipestone. Hiawatha is considered Longfellow's greatest poem. We cannot foretell for all time the fate even of what are now regarded as masterpieces. If a time should ever come, say a million years hence, when the writings of the nineteenth century lie buried beneath the accumulated productions of pen and press so that the fame of Lincoln, for instance, may be but a breath associated with the last flickering flame of dying slavery, it is reasonable to suppose that Longfellow will have a lingering reputation as the author of a quaint, melodious poem, setting forth the legends of an ancient, aboriginal race said to have inhabited the forests and plains of central North America.

The success of these two poems encouraged Longfellow to write a third, *The*

Courtship of Miles Standish, the scene of which is laid in Plymouth. The subject matter is drawn from the early settlement of Plymouth colony. Five thousand copies of this poem were sold by noon on the first day of its appearance. In 1863 the *Tales of a Wayside Inn* were published,—a number of stories told in verse, grouped together after the fashion of Chaucer's *Canterbury Tales,* except that they are represented as told in an old weather-beaten inn at Sudbury, where Longfellow and a few friends were wont to meet occasionally. Some of the more noted of these tales are *Paul Revere's Ride,* a well known story of the Revolution; *The Birds of Killingworth,* teaching the desirability of shielding our native birds; *The Bell of Atri,* a plea for the old horse when he has faithfully performed his work.

Longfellow has been called a "comforting poet," one who has the right words to say to those who are sorrowing. In this respect he is certainly preëminent. Sometimes he is a little "preachy," and sometimes he moralizes openly, as in *The Psalm of Life,* being more like an essayist than like a poet, but in the hour of bereavement his poems will ever breathe a tender sympathy.

As long as the river flows,
As long as the heart has passions,
As long as life has woes.

At a class reunion held on the fiftieth anniversary of the graduation of its members, Longfellow read a noble poem entitled *Morituri Salutamus,* the Latin for "about to die, we bring greeting." This is distinctively the poem of an old man addressed to old men. We quote twelve lines of the poem:

Chaucer, at Woodstock with the nightingales,
At sixty wrote the Canterbury Tales;
Goethe at Weimar, toiling to the last,
Completed Faust when eighty years were past.
These are indeed exceptions; but they show
How far the gulf-stream of our youth may flow
Into the Arctic regions of our lives,
Where little else than life itself survives. . . .
For age is opportunity no less
Than youth itself, though in another dress,
And as the evening twilight fades away
The sky is filled with stars, invisible by day.

March 24, 1882, Longfellow passed away. He was buried in Mount Auburn Cemetery "under the gently falling snow."

SAYINGS FROM LONGFELLOW'S POEMS.

Architects of Fate.

The rapture of pursuing.

This is the forest primeval.

The silent homage of thoughts unspoken.

A boy's will is the wind's will.

"Why don't you speak for yourself, John?"

Somewhere the birds are singing evermore.

Home-keeping hearts are happiest.

Thou, too, sail on, Oh Ship of State!
Sail on, O Union, strong and great!

Oh, what would the world be to us
If the children were no more?
But we cannot
Buy with gold the old associations,

TRIBUTES.

His ballads have more of the old-time magic, more of the early simplicity, than those of any other modern English author.—Brander Matthews.

His poems are apples of gold in pictures of silver.—Curtis.

His nature was consecrated ground, into which no unclean spirit could ever enter.—Lowell.

He did not have Emerson's spiritual breadth and insight, nor Whittier's trenchant strength, nor Lowell's versatile gifts; but, as a maker of artistic verse, as a poet of the beautiful and of the human affections, his position of superiority is secure.—Abernethy.

When the American who is in London steps into Westminster Abbey—that splendid mausoleum of the worthy dead of a dominant race—nothing in the Poet's Corner thrills him more, if I may here express my own experience, than to behold the marble bust of Longfellow, the only memorial to a maker of American literature in that historic place. By general consent and the acclaim of two sister peoples, he was selected as the bard to represent us there.—Richard Burton.

There is no blot on the crystal purity of his writings.—Whittier.

Longfellow has taught more people to love poetry than any other English writer, however great.—Meiklejohn.

The white Mr. Longfellow.—Björnson.

Longitude, lŏn'jĭ-tūd, the measure of length. In geography, it is the angular distance on the earth's surface east or west of a north and south line called the first or prime meridian. English-speaking people reckon longitude from a north and south line passing from pole to pole through the Royal Observatory of Greenwich, near London. It is quite customary to reckon longitude from the capital of the nation. Formerly American maps were based on the meridian of Washington; French maps are still

based on the meridian of Paris; but there is a tendency to adopt the meridian of Greenwich as being in most general use. The equatorial distance around the earth is divided into 360 parts called degrees. A degree of longitude on the equator is 69.1 statute miles in length. As the meridians come nearer together as they approach the poles, the farther north a degree is measured the shorter it is. At the poles the value of a degree of longitude is zero. On the forty-ninth parallel, the boundary between the United States and Canada, the value of a degree is 45.8 miles. Longitude is reckoned as east or west from the prime meridian. The 180th meridian may be considered either east or west. A difference of fifteen degrees in longitude is equivalent to an hour's difference in time. See STANDARD TIME; INTERNATIONAL DATE LINE, etc.

Longstreet, James (1821-1904), an American soldier. He was born in Edgefield, South Carolina, January 8, 1821, and died at Gainesville, Georgia, January 2, 1904. He was graduated at West Point in 1842 and saw service in the West as well as in the Mexican War. In 1861 he resigned from the United States army and entered the Confederate army with the rank of brigadier-general. He was in both battles of Bull Run and served with credit in the peninsular campaign against McClellan. He commanded the Confederate right wing at Antietam and the left wing at Fredericksburg. At Gettysburg he held the rank of lieutenant-general and commanded the division that sustained the brunt of the fighting and furnished the memorable column that Pickett led. He saved the day for the Confederates at Chickamauga, met Burnside at Knoxville, and was back again with Lee in the battles of the Wilderness. Throughout the war he was one of the most dauntless fighters and hardest hitters on either side. After peace was established he accepted the results of the war in good faith. He settled in business at New Orleans, where he held office as surveyor of customs and again as postmaster. He removed to Georgia in 1875. He was United States minister to Turkey in 1880-1, and later marshal of Georgia and a United States railway commissioner. His reminiscences of the Civil War appeared in 1896 under the title *From Manassas to Appomattox*. See CIVIL WAR.

Longueuil, Quebec, the county town of Chambly County, is on the south shore of the St. Lawrence, opposite Montreal, and on the Quebec, Montreal & Southern Railroad and the Montreal & Southern Counties Electric Railway. The city is a residential suburb of Montreal and a popular summer resort. The principal industrial plants are a clothing factory, bolt and screw works, machine shops and a large steel mill that makes armor plate. There are public schools, a library, a Roman Catholic College and two convents. Longueuil had a population of 4,682 in 1921.

Looking Backward. See BELLAMY.

Looking-Glass. See MIRROR.

Lookout Mountain, Battle of, or Battle Above the Clouds, one of the battles that constituted the greater conflict known as the Battle of Chattanooga, which was one of the most important battles of the Civil War. The battle was fought on November 4, 1863, between a force of Federals under General Grant and one of Confederates under General Bragg. On the following day the famous Battle of Missionary Ridge was fought. See CHATTANOOGA.

Loom. See WEAVING.

Loon, a family of divers not remote from the grebe. Our species, three in number, are all northern birds. The common loon, or great northern diver, is a magnificent bird twenty-eight to thirty-two inches in length. It has a wing stretch of forty-four to fifty inches. The upperparts are black, bluish, or greenish. The underparts are pure white. The back and wings are spotted and barred with white. The head and neck are jet black. The latter is encircled by a white collar. The black bill is long, straight, and pointed. If we except the wood duck, the loon is the most showy of our inland water birds. It breeds from Illinois to the Arctic circle, and winters as far south as the Gulf of Mexico. It lives chiefly on fish, which it pursues by diving. It rises from the water with difficulty, yet, once on the wing, is a bird of strong flight.

It is a fine swimmer and diver, but it is hardly able to walk on land. When resting on shore it lies outstretched, or else sits on its tail like a penguin. The legs are thin and sharp, made to cut water like a knife, and set well back for swimming. The loon deposits two or three grayish-olive eggs in a slight depression in the ground. The nest is located a few feet from the water's edge, so that the parent bird may launch itself into the water like a ship gliding from the stocks. The young are black and fluffy. They delight to ride on the mother's back. They are soused unceremoniously when she goes down after a fish. The weird laughter of the loon is one of the delights of the northern camper. Thoreau speaks of the loud laughing as a "wild sound heard far and suited to the wildest lake." Sometimes the cry of the bird is as wild as that of a maniac. Canoemen have the phrase "crazy as a loon." See GREBE; AUK; COOT.

Lorain, Ohio, an industrial city and a shipping port, is on the south shore of Lake Erie at the mouth of the Black River, 25 miles west of Cleveland. It is served by several railroads. Lorain ships a large amount of coal to upper lake ports. The coal is received from eastern and southern Ohio and from West Virginia. Lorain receives large quantities of iron ore from the upper lake regions, principally Duluth. A large amount of the ore is converted into steel in Lorain and the remainder shipped to the Pittsburgh steel district. A large amount of lumber is also received via the lake and sent inland. In her industrial establishments are produced automatic shovels, foundry products, steel and machinery, and there is a large shipbuilding plant. Before the city was permanently settled early in the 19th century, a Moravian mission was established here. The city has good public schools and a Carnegie library. Population, 1920, 37,295.

Lorelei, lō′rĕ-lī, an imposing cliff, 433 feet high, overhanging the right bank of the Rhine between St. Goar and Oberwessel. It is pierced by a railway tunnel. A footpath—a twenty minute climb—leads to the summit. A fine view of the Rhine may be had. A pool formed by a widening of the river below the rock is famous for salmon. There is a tradition that the Nibelungen treasure lies here. The river at this point flows over a ledge of sunken rock and is broken into dangerous whirlpools and rapids. There is an old legend that a nymph of the Rhine, the Lorelei, had her abode high on the cliff, that when ships were passing she would sit there combing her golden hair and singing a wild strain which so captivated the sailors that they heeded not the danger until they were hurled upon the rocks. As the cliff has always been famous for its echo, it is probable that the story is an idealization of the dangerous rock and its echo. Both poets and painters have made use of the tradition. Heine's poem, *The Lorelei,* which appeared in 1823, is one of the most popular ballads in the German language. See RHINE; HEINE.

Lorimer, George Horace (1868-), an American journalist, editor and author, editor-in-chief of the *Saturday Evening Post* since 1899. Mr. Lorimer was born at Louisville, Ky., and was educated at Yale University. After graduation he worked in Chicago for a time with the packing firm of Armour and Co., and later took up journalism. In 1902 he attracted very favorable attention with his *Letters of a Self-Made Merchant to His Son.* He is the author of *Old Gorgon Graham, The False Gods* and *Jack Spurlock—Prodigal.* Under the direction of Mr. Lorimer the *Post* has attained its present high literary standard. In 1914 it had the largest circulation of any periodical in the United States.

Lorna Doone, lôr′nä doon, a novel by Richard Blackmore, published in 1869. It is a romance of Exmoor. It is written in autobiographical style, the writer purporting to be John Ridd, the son of a farmer who was slain by the Doones, a band of outlaws. The Doones made their home in an almost inaccessible rocky defile in Bagworthy Forest. John Ridd, while still a boy, accidentally meets Lorna Doone, the pretty little "Queen" of the Doones. He never forgets the little girl and determines to win her for his wife. His dangerous wooing, their marriage, the plot of the

Doones to destroy his home, and the final defeat of the outlaws, make up an exciting story which carries the reader away to a free out-of-door life, with the rush of falling water, the sweep of wild winds, and the courage and daring of a brave-hearted, strong-willed youth. The simple, somewhat quaint language of the story is in keeping with the times and with the character and mental equipment of honest John Ridd. Lorna Doone is the best known of Blackmore's writings and is as popular in America as in England. See BLACKMORE.

Lorenzo Monaco, also known as Don Lorenzo, (1370-1425), an Italian painter, who, it is thought, was born at Siena or Florence. He took the vows of a Camaldolese monk in 1391 at the monastery of Santa Maria degli Angeli. His paintings show the influence of the Sienese school. His subjects were mostly religious, and he painted a series of madonnas, examples of which are to be found in the Metropolitan Museum, New York, the Berling Gallery and the Collegiate Church at Empoli. Among his known works are a triptych, now in the Uffizi Gallery, Florence, and an *Annunciation;* also frescoes from the *Life of the Virgin* in the Bartholini Chapel, Santa Trinita, Florence. He was also a painter of miniatures, some of which are preserved in the Biblioteca Laurenziana in Florence. Filippo Lippi was his pupil, and Fra Angelico's art was influenced by him.

Lorette Ancienne, a Canadian Village, 7 miles from Quebec, on the Canadian Pacific railroad. It has a large water works in connection with Lake Charles, from which Quebec gets its supply of water. The Huron Indians took refuge here after they were defeated in 1650, and a number of their Christianized descendants still live at Jeune Lorette, 3 miles to the north. Lorette Ancienne contains a reproduction of the famous chapel and statue of the Virgin at Loreto, Italy. The picturesque falls of Lorette are also an attraction.

Los Angeles, los an' gel es, the county seat of Los Angeles county, is the metropolis of California, the tenth city in the United States and the largest city on the Pacific Coast of America.

It is beautifully situated in a park-like region fifteen miles from the Pacific Ocean and ten miles south of the Sierra Madre Mountains. San Diego is 125 miles south and San Francisco 484 miles north by west. The beauty of its location combined with an ideal climate attract thousands of tourists, most of whom spend the winter in the city or towns nearby.

GENERAL DESCRIPTION. The site is undulating with an average elevation of 300 feet above the sea, and a few hills in the northern part. The main part of the city is regularly laid out and the streets cross at right angles. Broadway is the chief retail street, and on Main and Los Angeles streets are found many of the wholesale establishments. In the residential sections the streets are boulevarded, and are lined with palms and other shade trees. Most of the residences are surrounded by green lawns adorned with shrubs and flowers. The manufactories and large warehouses are along the Los Angeles River which runs through the city. There is also a Chinatown and a Mexican settlement. A broad strip of land connects the main city with its harbor on San Pedro Bay, 18 miles distant. The entire area of the city is 106 square miles.

PUBLIC BUILDINGS. The most important public buildings include the Federal Building, costing $2,250,000; the county courthouse and the Hall of Records, the City Hall, the Y. M. C. A., the Y. W. C. A., the Bible Institute, Shrine, Temple and Trinity auditoriums, and the Blanchard Art Building.

Among the leading church edifices are the Roman Catholic Cathedral, Saint Paul's Cathedral (Episcopal), the First Methodist Episcopal, the First Congregationalist, the First Baptist, Immanuel Presbyterian and the Old Plaza Church, of historic interest as the headquarters of General Fremont. The leading hotels include the Ambassador, the Alexandria, the New Rosslyn, the Clark and the Lankersheim. The great banking, office and mercantile buildings are all modern structures and are unexcelled by those of other cities. Among the prominent office buildings are the Story building, the Edison building,

the Union Oil building, the Investment building and the buildings of the Merchants National, the Security and the Los Angeles banks. The most important commercial building is the Wholesale Terminal, a modern concrete structure having 37 acres of floor space and costing $10,000,000. It is the chief center of the wholesale trade in vegetables, fruits and walnuts.

Water Supply. The water is supplied from the Owens River, whose source is in the melting snows of the Sierras. The water is taken from the river ten miles north of Independence, Calif., and is carried through an aqueduct 235 miles in length, the longest in the world. The source has an altitude of 7,000 feet and the water is delivered to all parts of the city by gravity. In addition to supplying the city with water for domestic and municipal purposes, the aqueduct furnishes 70,000 horse power for manufacturing and is also used for irrigating hundreds of acres of adjoining land. The aqueduct was begun in 1907 and completed in 1913, at an expense of $25,000,000.

Industries and Commerce. The moving picture industry leads all others in the value of its output, which in 1919 amounted to $150,000,000. The second industry in value is the production and refining of petroleum and the manufacture of oil-well machinery. Shipbuliding, which has been developed since 1917, is the third industry in value. Large shipyards and a dry dock are located at the harbor and about 14,000 men are employed. Other important industries include the manufacture of automobile parts; furniture and other articles of wood, cotton weaving, the manufacture of clothing, canning fish, and the manufacture of chemicals, drugs and fertilizer.

The water power supplied by the aqueduct, the cheap fuel furnished by an abundance of crude petroleum and excellent transportation facilities make Los Angeles a desirable location for manufactories.

Los Angeles is the chief shipping point for Southern California, and the business center for a rich agricultural and mining district. The Atchison, Topeka and Santa Fe, the Southern Pacific and the Los Angeles and Salt Lake railroads afford ample rail transportation to all parts of the country. The city is also the center of one of the most complete electric interurban systems in the world, with lines extending to all the important towns within a radius of sixty miles . The city has regular steamship connection with San Diego, San Francisco and Seattle, and with Honolulu, the Philippines, Australia and the ports of China and Japan. Fruit, vegetables, walnuts and canned fish are shipped in large quantities. Lumber is one of the chief imports, and Los Angeles harbor has become one of the first lumber importing harbors

Parks and Playgrounds. Los Angeles has 25 parks, 34 playgrounds and 12 all-the-year round recreation centers. Griffith park with 3,015 acres is the second largest city park in the country. It has golf links, a zoological garden and miles of perfect roads winding about the hills. Pershing Square, formerly Central Park, in the heart of the city, has a soldiers' monument and a notable fountain. Exposition Park contains a museum of art and science in which are found some of the rarest fossils in America. Exposition Park also contains a great athletic field for polo events, races, college meets, football and other major sports, together with playgrounds and swimming pools. Beverly Hills Speedway, with a seating capacity of over 30,000, is said to be the finest course for motor events in the world.

The play grounds are in charge of a playground commission. Besides the ordinary playground activities, the commission maintains three municipal camps in the government forest, where, during the summer, families may enjoy outings at slight expense and also have the services of expert playground directors.

Surf bathing and other amusements are found in the beach towns—Santa Monica, Orchard Beach, Venice, Rodondo and Long Beach—each of which is connected with the city by an electric line. A short steamer ride brings one to Catalina Island known far and wide for its marine gardens. Mount Wilson, a few miles distant, has one of the finest astronomical observatories in the world.

INSTITUTIONS. The University of Southern California (Methodist Episcopal), Occidental College (Presbytertian), Saint Vincent College (Roman Catholic), the Bible Institute, McClay Theological College and the State Normal School are the leading institutions of higher education. Besides these, there are over 140 private schools and colleges, covering all lines of professional and vocational education. The public school system is one of the best in the country. Hospitals and charitable institutions adequate to the needs of the city are maintained.

HISTORY. The first settlement was made in 1781, by Spaniards from Mexico and was named Pueblo de Neustra Senora La Reina de Los Angeles or 'The City of Our Lady, The Queen of the Angels." San Gabriel Mission a few miles east and adjoining the town of Alhambra, had been founded ten years earlier. Until 1847, Los Angeles and Monterey were alternately the capital of the Mexican province of California. Los Angeles was taken by United States troops under General John C. Fremont in 1846, but there was an unrising of the inhabitants and the town was retaken by General Stephen Kearney in 1847. The year following the admission of California into the Union, 1851, Los Angeles became a city. Its growth was slow until the completion of the Santa Fe Railroad in 1885. The discovery of petroleum in the vicinity lent an added incentive to settlement, and since the beginning of the twentieth century the growth has been rapid. The population in 1910 was 319,198; in 1920 it was 576, 673. The aqueduct completed in 1913, has been the city's most stupendous work.

The early Spanish settlers left their impress upon the surrounding country. The names of the mountains, and rivers and all the oldest settlements are Spanish. The Mission of an San Gabriel is of special interest because of the old church and its collection of pictures and relics of early California. An interesting mission play, depicting the life of the early missionaries, is given at San Gabriel every winter and it attracts many tourists.

Lossing, Benjamin John (1813-1891), an American historian born in Beekman, N. Y. At the age of 13, he was apprenticed to a watchmaker in Poughkeepsie and became a watchmaker and engraver. In 1835, he became the editor of the Poughkeepsie *Telegraph.* Later he went to New York as a wood engraver and illustrated his own writings. His *Pictorial Field Book of the Revolution,* which appeared in 1851, attracted attention to him as an authentic and interesting writer on American history. This was followed by similar works on the Civil War and the War of 1812. He is also the author of a series of school histories, of an *Encyclopedia of United States History, Life and Times of Philip Schuyler,* the *American Centenary* and a *Compendious History of the Commonwealth of New York.*

Loti, lo-té, **Pierre** (1850-1923), a French novelist whose real name is Louis Marie Julien Viaud. He was born at Rocheford of Hugenot ancestry and at the age of seventeen entered the marine service in which he traveled extensivly as a naval officer. In 1910 he was placed on the reserve list. His early works are a combination of fact and fiction, and portray his own life and the spirit of modern literature in his own country. His novel, *Mon frère Yves,* describes the life of a French bluejacket, and won him great fame.

Lottery, a distribution of prizes by chance. The usual method is to place numbered tickets in a wheel and allow some person, usually a child, to draw the lucky numbers. The ticket first drawn entitles the owner to the first prize. Sometimes the prizes or tickets representing them are placed in a second wheel. The first holder's ticket drawn entitles the owner to the prize named on the first prize ticket drawn.

The object of lottery is gain. It is understood that the tickets are sold for a sum total greater than the entire value of the prizes. The inducement to purchase is the possibility of large winnings in return for small investments. The average person is willing to risk a small amount for the chance, however remote, of winning a large amount. The certainty of small loss and

the improbability of gain are outweighed by the possibility of drawing a grand prize. After a drawing, the prizes are bruited far and near; the blanks are not heard from. Whether a turkey raffle or a prize drawing, the lottery is a form of gambling.

The lottery is not of recent origin. It is as old as casting lots. Chance has always served to amuse and interest the mind. The Roman emperors introduced lotteries as a form of public amusement. Nero is said to have aroused interest by offering such prizes as a house or a slave. One of his successors introduced such variations as a golden vase and six flies. During the reign of Louis XIV court fêtes were enlivened by public drawings.

Governments have not been above filling the public treasury by lottery. The republics of Italy—Venice, Florence, and Genoa—obtained large revenues from public drawings. In France the lottery rose under successive ministers of finance, to be an important source of public income. The expenses of the War of the Spanish Succession were defrayed in this way. Necker, minister of finance, put down the lotteries as good for 4,000,000 livres a year. In 1776 all church, charitable, and private lotteries were suppressed in favor of the lotteries carried on by the government. Five-twenty-fourths of the receipts were retained for profit and expenses; nineteen-twenty-fourths were returned in prizes. There were many small prizes and a few large ones. The purchase of tickets became a craze, and the calculation of chances a mania. The French lottery was suppressed ultimately in 1836. The deposits in the French savings and loan banks showed a sudden increase.

Lotteries were popular in all the countries of Europe. Frankfurt, Vienna, and Amsterdam were centers of excitement. In England public lotteries were authorized as early as 1569 for the repair of harbors, the improvement of cities, and other important objects. From 1793 to 1824 the British government made an average profit of $1,700,000 a year out of lottery schemes.

In America lotteries were correspondingly popular. The Virginia Company was authorized to raise funds by drawings, the object being the settlement of the New World and the improvement of the savage. As early as 1699 a meeting of Boston clergymen denounced lotteries as "a cheat," and their promoters as "pillagers of the people," but, none the less, Faneuil Hall, after its destruction by fire, was rebuilt with funds derived from a public lottery. In 1776 the Continental Congress, at the suggestion of Jefferson, authorized a lottery for the benefit of the public purse. During the first thirty years of the American Congress no less than seventy acts were passed authorizing lotteries for specific purposes.

In 1833 Massachusetts and Pennsylvania passed acts forbidding lotteries. Other states followed in rapid succession. The last stronghold of the lottery was Louisiana. During the period following the Civil War, when the state treasury was exhausted, a company that had been hunted from state to state succeeded in inducing the legislature to charter the Louisiana State Lottery. The state treasury received a fixed share of the receipts. By the arts known to corporations, the company kept its hold on the state. In 1890 Congress came to the aid of the anti-lottery people with an act forbidding the carriage of lottery advertisements or tickets by mail.

Lotus, a name applied to at least three water lilies: the yellow nelumbo or water chinquapin of India, North Africa, and the United States as far northwest as Minnesota; the blue water-lily; and the large white water-lily of the Nile. The last named is the lotus of the Nile. It was the favorite flower of Egypt. The peasants ate the root. Ladies carried the flower for its fragrance, and architects shaped the capitals of columns to represent the flower-bud. It is now to be found only in pools of the Delta, and in the upper waters of the Nile. The nelumbo or Indian lotus was the symbol of female beauty among the Chinese, and was a sacred flower among the Hindus, whose idols were seated on a lotus-like throne. See WATER LILY.

Lotus-eaters, a name given by Homer to a tribe on the northern coast of Africa who lived on the berries of the lotus tree or shrub. The plant is in no way related to the lotus water lily. The natives also made a sweet wine from its fruit. Ulysses and his companions, on their return from

the siege of Troy, were kindly entertained by these people, but, eating the fruit of the lotus, they lost all ambition and all desire to seek their native land. A "lotus eater," then, is one whose delight in foreign pleasures has deprived him of a desire to return. The term is applied also to one who in dreamy, absent-minded contemplation of air castles forgets home affairs and everyday duties.

Loubet, Emile (1838-), a distinguished French statesman, President of the Republic of France from 1899 to 1906, he was born at Marsanne, department of Drome, and studied law in Paris. Admitted to the bar in Montelimar, M. Loubet was elected mayor of that city in 1870. He was returned to the Chamber of Deputies in 1876, and entered the Senate in 1885. During 1887-88 M. Loubet was Minister of Public Works. In 1890 he was Prime Minister, and was chosen president of the Senate in 1895 and again in 1898. M. Loubet is a very able minister, and during his Presidency was brought about a more amicable relation between France and Great Britain than had existed for many years previously.

Louis IX (1214-1270), king of France. He is commonly known as Saint Louis. During his childhood, the kingdom was managed by his mother, Blanche of Castile. He was canonized by the pope for the part he took in an important crusade against the Saracens in the Holy Land.

Louis XIII (1601 - 1643), king of France. He was the son of Henry IV. Cardinal Richelieu became his prime minister, under whose administration the Huguenots lost political power, the government was centralized, and France was started on her period of supremacy.

Louis XIV (1638 - 1715), king of France. He is known as the "Grand Monarch." He came to the throne in 1643 and died in 1715. Cardinal Mazarin was his prime minister. He was a despotic ruler of great ability, the author of the famous saying, "I am the state." Under his rule France was the strongest military power in Europe. The nations combined against him. He was humbled finally by the English Duke of Marlborough on the battlefields of Blenheim and Oudenarde. He built the famous palace of Versailles at a cost of $15,000,000. He revoked the Edict of Nantes and drove the Huguenots from France. His reign was noted also in literature. It corresponds to the Elizabethan era in England.

Louis XV (1710-1774), king of France. He was the grandson of Louis XIV. During his reign France participated in the war of the Austrian Succession against Austria, and in the Seven Years' War in alliance with Austria. The wars were disastrous to France and she lost Canada and Louisiana; the people were impoverished, and the nation bankrupt.

Louis XVI (1754-1793), king of France. He was a man as distinguished for the purity of his life as Louis XV was noted for debauchery. His special delight was the construction of mechanical toys, such as locks or clocks. In 1770, he married Marie Antoinette, archduchess of Austria. It was during his reign that the French aided the American Revolutionists. Turgot and Necker, his prime ministers, strove to bring order into French finances, but finding it impossible, Louis was obliged to summon a states-general, the first since 1614. When the French Revolution broke out Louis at first appeared to concur with the wishes of the people for a change of government, but, having attempted to escape from the country, he was arrested and thrown into prison. He was guillotined January 21, 1793.

Louis XVIII (1755 - 1824), king of France. He was the brother of Louis XVI, and after the overthrow of the monarchy in the Revolution, he fled to England where he remained until the defeat of Napoleon in 1814. He was restored to the throne by the Allies; was obliged to flee again during the Hundred Days, and was again restored after the battle of Waterloo. See HUNDRED DAYS.

Louisburg, Nova Scotia, on Cape Breton Island, is important for its historical interest only, for otherwise it is only a fishing village with a population of 1,150. It has a harbor that measures two and one-half by one and one-half miles, and is never ice bound. The village

Sugar Mill
Truck Gardening

LOUISIANA INDUSTRIES

Rice Mill
Marketing Watermelons

was founded by the Acadian French, who held and fortified it even after the remainder of Acadia was ceded to Great Britain, 1713. They built a huge, strong fort that was a constant menace to Britain's colonies to the south. The fort was attacked in 1744 by the British during King George's War, and surrendered in 1745. Three years later it was restored to the French. In 1758, during the French and Indian Wars, Louisburg was again besieged by the English, and again the fortress was surrendered; and this time the stronghold was not restored. The industrial life of the modern Louisburg depends altogether on the fisheries.

Louise, Lake, an extremely beautiful lake lying at an altitude 5,645 feet in the Canadian Rockies, and often referred to as the "Pearl of the Canadian Rockies." The lake is in the province of Alberta, 34 miles northwest of Banff, and may be reached by electric railway from Laggan, a station on the Canadian Pacific. Lake Louise has been rapturously described by numerous writers, and no one who tours the Canadian Rockies fails to visit this bit of water. It is so ringed about by forested, snow-covered peaks that the wind seldom disturbs its surface. The Canadian Pacific maintains here a finely appointed hotel for the accommodation of tourists.

Louisiana, one of the Gulf states, lies at the mouth of the Mississippi River, by far the greater portion being on the western side. The Gulf of Mexico forms the southern boundary; a large part of the western boundary is formed by the Sabine River; and the lower eastern state line is the Pearl River.

Physical Features. Louisiana is one of the lowest states in the Union, averaging seventy-five feet above sea level. Near the northern border a height of about 375 feet is found, from which the land slopes gently toward the Gulf. In the extreme north is an area of rolling forest land; south of this is a prairie region; and still farther south is a coastal plain patterned with lakes and bayous. Along the Mississippi and some of the other rivers the land is below high water level and must be protected from floods by high, strong levees.

A large part of the state, watered by the Mississippi, Red, Sabine, Black and other rivers, has a rich alluvial soil that is highly productive. Along the Gulf of Mexico the summer temperature is about 90° while farther north it averages about 83°. In January the temperature ranges from 45° in the north to 60° in the south. Thus the state enjoys a semitropical climate. The forests are extensive and very valuable, and a luxuriant vegetation is to be found everywhere. The state has long been noted for the profusion and beauty of its wild and cultivated flowers. Louisiana is the winter home of great flocks of migratory birds, and the permanent home of some other songsters never seen in the north.

Minerals. The most important minerals of the state are sulphur and petroleum. Louisiana leads the Union in the production of the first, and produces an average of twenty million barrels of the second annually. The petroleum fields lie in the north central part of the state, forming a continuation of the Mid-Continent field; and along the southwestern boundary, here being a part of the Gulf Coast field. Small deposits of iron and of an inferior quality of coal are found, but the rock salt deposits of the state are of considerable importance.

Agriculture. The principal industry of Louisiana is agriculture, and in the production of certain crops no state is more prolific. Cotton, corn, sweet potatoes, rice, sugar cane, oats and tobacco are raised in great quantities. The quality of the tobacco, cotton and sweet potatoes is particularly high. In the subtropical climate that obtains along the Gulf citrus fruits are grown, as well as apples, pears, peaches and other fruits native to the temperate zone. The raising of strawberries and other garden products for northern markets is very profitable to large numbers of people. Louisiana yields approximately fifty per cent of the rice grown in the United States, and about seventy-five per cent of the sugar cane; but corn and cotton are more valuable to the state, and still lead in acreage. Peanuts, hay and potatoes are also grown.

Manufacture. Lumber production, and the industries allied with it, are the

principal manufacturing industries of Louisiana, though since 1880 the general manufacturing industries have shown steady increase. Finished lumber and sash and doors are produced to the value of approximately seventy-five million dollars annually. In connection with the petroleum industry, which has enjoyed steady growth, the refining industry is now very important. The cleaning and polishing of rice is an industry that engages many people, and the same may be said of the production of cotton-seed oil, cotton-seed cake, and fertilizer. Refineries for the production of molasses and cane sugar are to be found in the strictly agricultural districts. Burlap bags, barrels, cars, foundry and machine shop products and printed matter are also important Louisiana manufactures. The centers of manufacture are New Orleans, Shreveport, Alexandria, Baton Rouge, Monroe and Lake Charles.

Transportation. Owing to its numerous navigable rivers, affording access to almost every part of the state, Louisiana has a cheap and easy means of transporting its many products. This fact no doubt accounts, in part, for the comparatively late and slow development of railroads in the state. Trunk lines traverse the state from north to south and from east to west, affording, with the water highways, ample carrying facilities. The principal railroads are the Southern Pacific, Texas & Pacific, Queen & Crescent Route, Rock Island, Illinois Central, Kansas City Southern and Yazoo & Mississippi Valley. The chief railroad center is New Orleans, the most important river and sea port. Lake Borgne has been linked to the Mississippi River by canal, shortening by many miles the distance from New Orleans to the Gulf.

The People. Louisiana has a larger urban population than have any of the other southern states, largely because New Orleans contains approximately one-fifth of the entire population. There are more than half as many Negroes as whites, the state standing in seventh place among the states of the Union in the matter of Negro population.

The greater part of the white inhabitants of the state are descendants of the French settlers of this region. That they are thrifty and industrious an examination of the industrial census of the state will prove. The capital of Louisiana, Baton Rouge, is in size the third city, Shreveport and New Orleans being larger.

Institutions. At Baton Rouge the state maintains institutions for the education of the blind, and the deaf and dumb, and at Pineville and Jackson are insane asylums. A beautiful soldiers' home is located at New Orleans; the state prison is at Baton Rouge; and at New Orleans there is also a house of detention and an industrial school and home for colored children. At Monroe there is a reform school for juvenile lawbreakers. The state has for many years maintained prison farms on which convicts are employed in agriculture. Such farms are to be seen at Angola, where the farm has an area of 8,000 acres; at Hope, where there is a 2,800 acre farm; and at several other places in the state, where the farms are not as large.

Education. Until well into the present century, the educational institutions were entirely inadequate, and such as there were could hardly lay claim to modernity. Now, however, all this has been changed. The Education Law, passed in 1912, provided for the needed reforms, giving comprehensive powers to the state board of education. Later constitutional amendments made still further provisions, resulting in a thorough and complete revision of the educational system. In the public schools alone there are now enrolled almost 360,000 pupils, of whom two-thirds are white and one-third colored. Separate schools are provided for white and for colored children. Primary education is compulsory for 140 days a year between the ages of seven and fourteen. Secondary education is provided for by numerous public and private high schools.

The State University and the Agricultural and Mechanical College is at the head of the state system. There are numerous other institutions of higher learning for white and for colored students; notably Loyola University, at New Orleans; Tulane University, also at New Orleans; and Louisiana State Normal School at

Natchitoches. The foregoing are all for white students. For the education of the colored there are, at New Orleans, Straight University, Southern University and Leland University; at Baton Rouge, Southern University and Agricultural and Mechanical College; and the Louisiana Academy and Industrial Institute at Alexandria.

The Louisiana State University and Agricultural and Mechanical College grew out of the Louisiana State Seminary and Military Academy founded near Alexandria in 1853. The Seminary was removed to Baton Rouge in 1869, and in the year following was renamed the Louisiana State University. The Agricultural and Mechanical College was founded at New Orleans in 1873, and four years later the College was moved to Baton Rouge and merged with the older school.

The University comprises colleges of arts and sciences, engineering, agriculture, the teachers' college, school of law, the Audubon Sugar School and a graduate department. Agricultural experiment stations are maintained by the University at Baton Rouge, New Orleans, Hammond, Calhoun and Crowley. The Audubon Sugar School is a unique institution, the only one of its kind in the Union, and is engaged in teaching sugar chemistry, sugar engineering and the superintendence of sugar factories. Tuition at the University is free except to foreign students. The library contains 48,450 bound volumes. In 1922 the University had 110 instructors and 1,960 students.

GOVERNMENT. Louisiana has had nine constitutions, the last one adopted in 1913. This instrument provides for a bi-cameral legislature, the upper house to consist of not more than 41 nor less than 36 members, the lower house to consist of not more than 120 members. The term of office in each house is four years.

Executive power is vested in the governor, lieutenant-governor, secretary of state, attorney-general, treasurer and auditor. The governor and treasurer are not eligible for reelection.

The judiciary consists of a supreme court of one chief justice and four associate justices, elected for terms of twelve years. The inferior tribunals are the district courts, courts of appeal, courts of justices of the peace and juvenile courts.

HISTORY. While it is believed that the Mississippi River was found and partially explored from its mouth northward by the Spanish explorer Alvarez de Pineda in 1519, and that some of De Soto's followers traversed a part of the present state in 1542, it is not until 1682 that authentic Louisiana history begins. In this year Robert La Salle descended the river and took possession of the entire valley, naming it Louisiana to honor his king, Louis XIV of France. A permanent settlement, the first, was made near the present Biloxi, Miss., by d'Iberville in 1699. John Law's Company of the West secured trading rights in Louisiana in 1718, and in the years following many colonies were planted in the territory. New Orleans, founded in 1718, was made the capital in 1722. Louisiana east of the Mississippi, excepting the island of Orleans, was ceded to the English in 1763, the western half having been secretly ceded to Spain in 1762. The people were dissatisfied with the Spanish rule, but the Spaniards succeeded in establishing themselves. In 1800 Napoleon secured the transfer to France of the Spanish territory, and three years later he sold it to the United States for $15,000,000.

The Territory of Orleans was admitted to the American Union as Louisiana, the fifth addition to the original thirteen states, in 1812. The English attacked New Orleans during the War of 1812. Progress was rapid after unification; the capital was moved to Baton Rouge in 1852; but during and immediately after the Civil War Louisiana was the scene of much bloodshed, which was aggravated by an almost complete economic breakdown. After 1884, however, the state revived politically and industrially. Because of its natural gas and petroleum resources, and the unusual fertility of the greater part of its soil, Louisiana's material future is especially well assured. See LOUISIANA PURCHASE; NEW ORIEANS; CREOLE; ACADIANS; COTTON; SUGAR; EDWARD LIVINGSTON; CODE.

STATISTICS. The following statistics are the latest to be had from trustworthy sources:

Land area, square miles	45,409
Water area, square miles	3,097
Forest area, acres	17,000,000
Population (1920)	1,798,509
White	1,098,252
Negro	700,257
Asiatic and Indian	1,641
Foreign born	44,871
Chief cities:	
New Orleans	387,219
Shreveport	43,874
Baton Rouge	21,782
Alexandria	17,510
Monroe	12,675
Number of parishes (counties)	64
Members of state senate	39
Members of house of representatives	101
Salary of governor	$7,500
Representatives in Congress	10
Assessed valuation of property	$726,291,145
Bonded indebtedness	$14,345,981
Farm area, acres	10,019,822
Improved land, acres	5,626,226
Corn, bushels	35,022,000
Rice, bushels	16,560,000
Cotton, bales (500 lbs.)	295,000
Oats, bushels	1,265,000
Sweet potatoes, bushels	8,272,000
Cane syrup, gallons	25,423,341
Wool, pounds	508,000
Domestic animals:	
Horses	211,000
Mules	131,554
Milk cows	382,000
Other cattle	316,532
Sheep	209,000
Swine	1,250,000
Manufacturing establishments	2,617
Capital invested	$462,209,057
Operatives	98,265
Raw material used	$431,403,867
Output of manufactures	$676,189,770
Lumber products	$ 75,000,000
Petroleum, barrels (42 gals.)	35,649,000
Miles of navigable rivers	4,794
Miles of railway	5,276
Teachers in public schools	8,966
Pupils enrolled	354,079

Louisiana Purchase. In 1682 La Salle, bearing a commission from the French king for that purpose, penetrated the Mississippi Valley and took possession of it in the name of France. He called it Louisiana in honor of the French monarch, Louis XIV. The territory east of the river was ceded to the English at the close of the French and Indian War. In 1762 France ceded the territory on the west of the river to Spain. In 1800 Louisiana was reconveyed to France by a secret treaty. At this time there were no railroads. The early settlers of the Ohio Valley maintained communication with the Atlantic coast by long, tedious, overland journeys. The only outlet for their products lay through the Mississippi by way of New Orleans. Various regulations, apparently tending to exclude American boats from New Orleans, led President Jefferson and other far-seeing statesmen to feel that the possession of this city was essential to American prosperity. Whether Spain or France or Great Britain owned New Orleans there was danger to American commerce. Jefferson wrote Robert R. Livingston, our minister to France, "There is on the globe one single spot the possessor of which is our natural and habitual enemy. It is New Orleans." He instructed Livingston to purchase, if possible, the site of the city and a strip along the western border of the river, running from Tennessee to the Gulf. James Monroe was sent as a special envoy to assist Livingston. To the surprise of the Americans, Napoleon offered to sell not only a strip, but all Louisiana. The offer was accepted at once, save that there was some haggling over the price. Napoleon asked $15,000,000, an amount thought to be excessive. Finally, however, this price was agreed to, and the greatest real estate transfer on record was completed, the treaty being signed April 30, 1803. It was stipulated that the United States government should retain $3,750,000 to pay claims of Americans against the French government. Jefferson was ridiculed by his friends and hounded by his enemies for spending good money for so much worthless territory. Members of Congress declared that Louisiana would never be worth a dollar to the American Union. It is sufficient to answer that thirteen states, in whole or in part, Louisiana, Arkansas, Missouri, Iowa, Minnesota, North Dakota, South Dakota, Nebraska, Kansas, Colorado, Wyoming, Montana, and Oklahoma have been formed out of Louisiana. In 1900 one-fifth of the population of the United States resided in this region. According to the latest census report the value of farm land and buildings is placed at $22,269,088,629. The purchase of Louisiana led to the extension of the northwest boundary to the Pacific, and the later acquisition of territory from Mexico. See JEFFERSON.

Louisiana Purchase Exposition, an exposition held in St. Louis in commemoration of the purchase of Louisiana. It was opened April 30, 1904, and is considered one of the most successful expositions the world has known. Forty-two states and fifty-three foreign governments participated in making exhibits. There were fifteen great departments, each an exhibit in itself. The buildings, streets, open spaces, lagoons, and canals covered an area of several hundred acres. The electric display was the greatest the world has ever seen. The transportation building was a history of progress. Models of the earliest English locomotives stood side by side with the first engines of American construction. They looked like dwarfs beside the monster locomotives of the present day. The Philippine Islands were assigned a reservation of forty-seven acres of rolling woodland and lakes. There were reproductions of the Spanish buildings, as well as the thatched huts of the natives, bamboo cottages, and rope bridges. Specimens of Philippine fishes, birds, buffalo, and other wild animals were shown. Special attention was given to an exhibit of the American Indians. There was an indoor exhibit of Indian work from the stone hammers of the cave man to the lace of the Leech Lake Indian and the blanket of the Navajo. The outdoor exhibit included Indian villages, consisting of skin tents, dugouts, and thatched huts, and every other known variety of aboriginal habitation. There were tall men from Patagonia, pigmies from Africa, and Ainus from Japan. There were exhibits of forestry, fishing, game, and mining, of pictures and sculpture. The different fruits and every imaginable agricultural production were shown on a large scale. Much was made of education. A separate building was set apart for this exhibit. The various states contributed no less than $6,500,000. The entire cost was not far from $30,000,000.

Louisville, Kentucky, is the largest city in the state and the third largest city south of the Ohio and east of the Mississippi. It is situated on the Ohio River, 50 miles west of Frankfort and 130 miles by water and 110 miles by rail southwest of Cincinnati, Ohio. Louisville is connected by steamer lines with thirty-three rivers tributary to the Ohio and Mississippi, and is served by no less than ten railroads, among which are the Southern, the Louisville & Nashville, Illinois Central, Chesapeake & Ohio, Baltimore & Ohio and Pennsylvania. This beautiful and enterprising city is sixty feet above the low water level of the river, along the south bank of which it extends for seven miles. At this point the river has a fall of twenty-six feet in two miles, and thus furnishes abundant water power for manufacture. A canal was built around the falls in 1830, and has been controlled by the Federal government since 1870. Three magnificent steel bridges, the longest being the Louisville Bridge, link the city with the Indiana shore. Because the falls are dangerous to navigation a lighthouse is maintained here; and at Louisville is the only inland Coast Guard station in the United States.

Parks and Buildings. Louisville has one of the finest park systems to be found in any city in the Union. The largest park in the system, Iroquois Park, is noted for its natural beauty; it has an area of 670 acres. Next in size and hardly less atractive is Cherokee Park, with 330 acres; it contains golf links and tennis courts. Along the river are Riverview, Shawnee and Fontaine Ferry parks, each of which has a spacious bathing beach. These parks, the Kentucky State Fairgrounds and the Government Fish Hatchery are linked together by a system of broad boulevards.

The armory, postoffice, Y. M. C. A., city hall, custom office, courthouse and the *Courier-Journal* building are especially noteworthy. Besides these there are many fine hotels, banks, hospitals and churches. The city contains monuments to the Confederacy and to Zachary Taylor, and statues of Henry Clay, Daniel Boone, Thomas Jefferson and other famous men. The city also contains the Masonic Widows' and Orphans' Home, German Protestant Orphans' Home, St. Joseph's Orphan Asylum and the Louisville Industrial School of Reform.

Industry and Commerce. Louisville is one of the largest leaf tobacco markets

in the world, and its manufactories of tobacco products are of the first importance. Exceptional transportation facilities have made the city a very important commercial center, and great quantities of farm produce, lumber, iron ore and coal are shipped annually. The manufactories are extensive and varied, producing leather, corduroy, boxes, drugs, furniture, pianos, organs, hardware, cement, wagons, agricultural machinery, porcelain bathtubs and men's clothing. Louisville is perhaps the most important meat packing center in the South.

Education. The University of Louisville, Louisville College of Pharmacy, Jefferson School of Law, Southern Baptist Theological Seminary, Kentucky Institute for the Education of the Blind, the State University for Colored People, Presbyterian Theological Seminary and a training school for nurses are all located here. The public school system is entirely modern, and there is a Carnegie library containing about 180,000 volumes, an art gallery and a museum of relics and curios.

History. Louisville proper was not settled until 1778, although an earlier settlement was made on an island in the river. The settlement was named for Louis XVI of France. The first city charter was procured in 1828. In 1850 the population was 43,194; in 1920 it was 234,891.

Louse, a parasitic insect infesting man and beast. True lice are wingless and have soft, sucking mouth parts, suited for drawing blood. Three species infest people. One lives in the head, two live on the body. A related species infests the horse, another the cow. Stockgrowers plunge their animals into a tank of tobacco water, or spray them with an infusion of tobacco or an emulsion of kerosene. Lice are often so numerous on an animal as to keep it poor. Bird lice or chicken lice differ from true lice in having biting mouth parts by means of which they feed on wool and skin, but chiefly on feathers. Fowls and birds wallow in the dirt and take a dust bath to render their feathers an impossible living place for lice. Book lice are small, pale, black-eyed lice that hide in books and feed on paper. They are classified near the bird-lice. The true louse glues about fifty bean-shaped eggs to a hair. These nits, as they are called, hatch in six days, and in eighteen days more they are full grown. With a fair degree of prosperity, therefore, for forty-eight days, the descendants of a louse colonist may have passed the thousand mark.

The head-louse often becomes annoying among school children where one or two children become infested and unless the teacher is on the alert, spread the pest among all their associates. Fish berries, the poisonous fruit of the cocculus, a climbing plant of the East Indies, will destroy both lice and eggs. The berries may be obtained of any druggist and should be dissolved in alcohol. Care must be exercised in the use of this remedy as the berries are exceedingly poisonous. The solution may be diluted and used frequently until the insects have disappeared.

Louvain, Belgium, an important commercial and industrial center, is one of the most ancient cities of Europe. It is situated in the province of Brabant, eighteen miles east of Brussels on the Dyle River. It has had a particularly stormy career; as long ago as 891 it was stormed by the Normans, and in 1914 was almost destroyed by the invading Germans. The town hall of Louvain, erected in the middle of the fifteenth century, is one of the finest examples of late Gothic architecture to be seen in Europe. The theater and post office were, before the World War, the finest among its modern buildings.

In the fourteenth century Louvain, through the enterprise of its cloth weavers, had attained to considerable commercial importance. But harsh treatment by their masters caused the weavers to rebel, and during the subsequent oppression they fled to England in large numbers. Plague swept the city in the sixteenth century, reducing the population by one-half. Later, however, the energetic citizens again brought the city to the forefront of commerce and built up profitable textile, chemical and other industries. The laces made here are of the finest quality and command high prices wherever they are sold.

The German invaders reduced to ruins

the famous church of Saint Pierre, the Gothic cathedral, only the towers of which now stand, and the well known University of Louvain, together with its equally famous library, both of which dated from the early part of the fifteenth century. At the same time about 300 of the citizens lost their lives. By the terms of the Peace Treaty, Germany is to furnish to Louvain books and manuscripts to the value of those that were destroyed. The foundation stones of a new library were laid in 1921, and England and the United States have contributed books for the new institution. The population of Louvain was 39,450 in 1920.

L'Ouverture, loo-vĕr-tür'. See TOUSSAINT L'OUVERTURE.

Louvre, lōō'vruh, a noted public building of Paris. It is one of the most extensive buildings in the world. It stands in the very heart of the city, extending along the north bank of the Seine for a distance of half a mile. The general plan of the building is that of a rectangle, except that it narrows gradually toward the east. The building includes three large courts and six small ones, in all forty-eight acres in extent. It represents a cost of many millions. The building has grown from two royal palaces half a mile apart. The old Louvre, at the extreme east, was a square, three-story building, including a large court. Catherine de Medici, not satisfied with the old residence, built the Tuileries, half a mile to the westward. The intervening distance was occupied by a labyrinth of narrow streets and mean buildings. These were subsequently removed and galleries were built from the old Louvre to the Tuileries, including the intervening space. The Tuileries were the city residence of the French monarchs during several reigns. Louis XVI was brought back from Versailles to the Tuileries by the market women. In 1792, it withstood an attack of 30,000 rioters armed with pikes. It was in this palace that the Swiss Guards defended the king.

It was in the Tuileries that the unfortunate monarch was arrested before his mock trial and execution. Napoleon I lived here for a time; so did Louis Philippe and Napoleon III. The abandonment of the palace by Empress Eugenie after the battle of Sedan marked the close of its history as a royal palace. In 1871 the Tuileries were burned by the Communists. Troops arrived from Versailles in time to save the Louvre and the galleries from serious danger. The rubbish of the Tuileries was subsequently carted away, and the gap replaced by a high iron fence. The old Louvre and the south gallery fronting the Seine are given over to art collections. The north gallery, fronting the Rue de Rivoli, that is to say, the side of the building farthest from the Seine, is occupied by city offices.

The Louvre collections date from the sixteenth century. Francis I was a patron of artists. Louis XIV and Cardinal Mazarin added largely to the collections of their predecessors. When the French armies returned from their victorious campaigns under Napoleon in Italy, the Netherlands, and Germany, they brought with them the art treasures of the museums and palaces of Europe to add to the collections of the Louvre. At the close of the Napoleonic wars many of these articles were returned, but the Louvre may still be termed without impropriety the art center of the world. It is said to require a brisk walk of two hours merely to pass through the suites of rooms and long galleries in which the various collections are displayed. The Egyptian Museum is the most important collection of the kind in Europe. The Asiatic Museum contains the French half of the treasures found in the excavations made on the site of ancient Nineveh, the other half being in the British Museum. The collection of ancient sculpture from Greece includes such works of art as the Victory of Samothrace, a celebrated statue of Mars, a fragment of the frieze of the Parthenon, and many other treasures, including the Venus of Milo, the most celebrated female statue in existence. There is also a collection of modern sculpture. There are over 2,000 paintings of high rank, including masterpieces by Titian, Raphael, Rembrandt, Murillo, Leonardo da Vinci, Dürer, Holbein, Rubens, and Van Dyck. They are arranged according to schools. Collections of jewels, bronzes, porcelain, stained glass,

and vases add to the renown of the Louvre. The French government takes the utmost pains to preserve the museums from danger by fire. They are thrown open to the public under proper guardianship. Certain rooms are set apart for the particular use of artists. Westward from the Louvre are the famous gardens of the Tuileries. They were at one time a royal pleasure ground, but are now thrown open to the public of Paris.

Lovejoy, Elijah Parish (1802-1837), an American abolitionist. He was born at Albion, Maine. After graduating from Waterville College he went to Princeton Theological Seminary, from which he was graduated in 1833. Though he was ordained to the ministry he did not take a church, but became editor of the *St. Louis Observer,* a strong Presbyterian paper. His attitude on the question of slavery was at first moderate. Then he became stirred by the lynching of a negro for murder, and published an editorial condemning the deed. The slavery sympathizers were incensed by it, and threatened him so violently that he left St. Louis and went to Alton, Illinois, with his printing press. There a mob seized it and threw it into the river. Anti-slavery people in Alton presented him with a new press, and, undismayed, he began in September, 1835, to publish the *Alton Observer.* Its columns rang with bold abolitionist doctrines, advocating the organization of an anti-slavery society in Illinois. Opposition to him was strong, and in August 1837, a second mob plundered his office and destroyed the press. A new press was destroyed as soon as it arrived. Then Lovejoy and his friends procured a fourth and placed it in a warehouse, guarded by twenty men. The night of November 7, 1837, this building was attacked by twice as many men as were defending it. Lovejoy warned them that if his men were attacked, they would shoot, but the mob paid no attention, and as they rushed upon the warehouse one of them was killed. Regardless of this another man tried to set fire to the warehouse. Lovejoy stepped out to shoot him, but was himself shot and killed. Then the mob rushed in and wrecked the press. Lovejoy's martyr-like death, with the remembrance of his brave utterances against slavery, did much to hasten the conflict which followed.

Lovelace, Richard (1618-1658), an English poet belonging to the Cavalier group of poets. His poems are chiefy lyrical. His best known lines were written in prison. See SUCKLING.

> Stone walls do not a prison make,
> Nor iron bars a cage;
> Minds innocent and quiet take
> That for an hermitage;
> If I have freedom in my love,
> And in my soul am free,
> Angels alone, that soar above,
> Enjoy such liberty. —Lovelace.

Lover, Samuel (1797-1868), an Irish novelist, was born in Dublin. At first he was a painter and attracted much attention by his work. He also at this time wrote ballads, one of which, *Rory O'More,* became very popular. He now turned his attention to writing sketches and novels portraying Irish life which were full of droll humor. Among these are: *Legends and Stories of Ireland,* the etchings for which were made by the author. Then followed *Rory O'More, a National Romance,* which Lover himself dramatized, and which became immensely popular owing to the loyalty and shrewdness of its peasant hero. *Handy Andy,* possibly the most popular of his works, appeared in 1842. This is a rollicking farce, an Irish servant lad being the hero. Other of Lover's writings are: *Treasure Trove,* and *Songs and Ballads.* Lover's complete works have been published under the title: *The Novels, Irish Legends, Plays and Poems of Samuel Lover.* Lover, in 1844, appeared in the United States, Canada and England, giving entertainments where he recited some of his prose and poetry with great success. During his last years he confined himself to ballad writing.

Low, Seth (1850-1916), an American educator and publicist who, as mayor of New York, was influential in effecting reforms in all brances of the city administration, and who also effected improvements in the public school system. He was born in Brooklyn, N. Y., and was graduated from Columbia College in 1870. Accepting a position with a tea importing house founded in New York by his father,

Mr. Low was admitted as a member of the firm in 1885, and upon its liquidation in 1888 he withdrew with a considerable fortune. He had early manifested an interest in public affairs. From 1882 to 1886 he was mayor of Brooklyn, twice elected on an independent ticket. Mr. Low was chosen president of Columbia College in 1890, and displayed remarkable administrative skill in transforming the institution. He increased the college proper in size, attendance and reputation. The college was moved to its present location and the name changed to Columbia University. Mr. Low was appointed delegate to the Peace Conference at The Hague in 1899, and in 1901 was elected Mayor of New York. He was a candidate for reelection in 1903, but was defeated.

Lowell, Abbott Lawrence (1856-), an American educator, born in Boston and educated at Harvard University and Harvard Law School. He practised law in Boston from 1880 to 1897, when he became lecturer on government at Harvard. In 1900 he was appointed professor of the science of government and in 1909 he was elected president to succeed President Charles W. Elliot.

Lowell, James Russell (1819-1891), an American author. He was born at Cambridge, Massachusetts, February 22, 1819, and died there August 12, 1891. He belonged to the eighth generation of American Lowells. Percival Lowell came from Bristol, England, to Newburyport, Massachusetts, in 1639. Lowell's grandfather, Judge John Lowell, caused the phrase, "All men are created free and equal," to be inserted in the constitution of Massachusetts, from which it found its way to the American Declaration of Independence. The poet's father, Charles Lowell, was a Unitarian clergyman in Boston, for fifty years pastor of the West Church. His mother, Harriet Spence, from whom he inherited his poetical and imaginative powers, was a gifted musician and linguist. The city of Lowell, Massachusetts, was named for an uncle. Lowell Institute, Boston, was named for another uncle. Lowell was the youngest of five children.

Elmwood, the family residence, was near Mt. Auburn Cemetery. It was an old Tory mansion, built just before the Revolutionary War by a "stamp" distributor. The grounds were spacious and were well set with fine English elms and ash trees. Lowell has described the birds and trees in one of his most delightful essays, *My Garden Acquaintance.* Longfellow, who lived in the Craigie House near by, wrote a poem on *The Herons of Elmwood.*

Lowell's father had a fine library. The lad grew up surrounded by literature. He was graduated at Harvard in 1838. He was wont to say that he read almost everything except the textbooks prescribed by the faculty. He read in several languages fluently. His power of application was such that he could read twelve hours a day with profit. In one of his letters, he calls himself the "last of the great readers." He cared little for newspapers, but in literature he was beyond doubt the best read man of the century.

Lowell's first choice of a profession was the law. Like Irving, Scott, and many another, he neglected his business for reading and for society. He never practiced. Although of use, no doubt, when later he occupied public position, the only visible result of his legal studies was a prose sketch entitled *My First Client.* Lowell was made class poet at Harvard, but was prevented from taking part in the graduation exercises by reason of temporary suspension. He began literary work by contributing to the columns of various periodicals. His first volume of verse, a slender affair entitled *A Year's Life,* appeared in 1841. He dedicated it to Una, well understood to be Miss Maria White, the sister of a classmate. In 1844 he brought her home to Elmwood as his wife. She was a beautiful woman, a writer of no mean ability. She had a strong influence over her husband, and brought him around to strong abolition views. *The Vision of Sir Launfal, The Fable for Critics, The Present Crisis, An Incident in a Railway Car,* and *Biglow Papers* belong to this period of his life.

Mrs. Lowell died in the autumn of 1853. A child was born to Longfellow on the same night, bringing from the latter the poem entitled *The Two Angels.* Lowell and his wife had four children, three of whom died in infancy. Mabel, the fourth,

is alluded to in the pathetic poem, *The First Snowfall,* beginning with the lines,

> The snow had begun in the gloaming
> And busily all the night
> Had been heaping field and highway
> With a silence deep and white.

On sending this poem to his editor Lowell wrote, "Print that as if you loved it. Let not a comma be blundered. . . . May you never have the key which shall unlock the whole meaning of the poem to you." Years later, Lowell married a Miss Dunlap, Mabel's preceptress. In 1855 he was appointed professor of modern languages at Harvard to succeed Longfellow. He spent two years traveling and studying in Europe to prepare himself for the position. In 1857 he became the first editor of the *Atlantic Monthly.* His salary was $3,000 a year. He stipulated that Holmes should be a contributor. In 1862 he was succeeded by James T. Fields. He then became editor of the *North American Review.* His essays contributed to the latter were published in book form, *Among My Books* and *My Study Window.*

During President Hayes' administration, Lowell was appointed minister to Spain. In 1880 he was transferred to England. His literary reputation and genial ways made him a social favorite. A sparkling and ready wit brought him into demand as an after-dinner speaker. Probably no other foreign representative of the United States did more to convert the British people to the belief that it was possible for America to produce a scholar and a gentleman. He was chosen to make the address on Coleridge when a bust of that poet was unveiled at Westminster Abbey. During this period, he published a volume entitled *Democracy and Other Essays.*

On Lowell's return to America, he resumed his residence at Elmwood. Here he continued to reside amid his beloved trees. At death he was laid at rest in Mount Auburn Cemetery near Longfellow. Commemorative exercises were held in Westminster Abbey and a memorial window was set in the chapter of that venerable edifice. In more senses than one it is true that

> **Two worlds their wreaths of honor have entwined**
> **About an open grave.**

As a lad Lowell had everything in his favor. He inherited ability, social standing, and old-fashioned integrity. He was ambitious to make something of himself and did not neglect his opportunities. He was a cultured, handsome, aristocratic, kindly man, full of humor and mother wit, one who attracted others to himself, a keen observer of men and public affairs. "In person, he was a broad-shouldered, full-bearded, strong, and cheery Anglo-Saxon." He was a sinewy, active man, with chestnut hair and beard. His face was expressive, his voice tender, clear, and crisp. Howells says of him: "His voice had as great a fascination for me as his face. . . . The perfect modulation, the clear enunciation, the exquisite accent, the elect diction,—these were the graces of one from whose tongue our rough English came as music, such as I should never hear from any other." Though born and brought up as one might say within sound of the ocean, Lowell was emphatically a poet of the land. He was a lover of trees, birds, and flowers. He preferred the garden or a meadow to the open sea; the shelter of a grove to a storm; the rippling of a brook to the roar of breakers.

The young reader desirous of making a pleasant acquaintance with Lowell may select *The Heritage, To a Pine Tree,* and *To the Dandelion. The Vision of Sir Launfal, The Courtin', The First Snowfall, Indian Summer Reverie,* and *Under the Willows* show Lowell's intense love of outdoor life. The *Fable for Critics* is interesting to the student of literature. The *Biglow Papers* give Lowell's frame of mind at the time of the Civil War. *The Cathedral* and *Commemoration Ode* are for mature readers. *My Garden Acquaintance, Moosehead Journal, A Good Word for Winter,* and *Democracy* are typical essays.

It is too early yet to speak of Lowell's rank in the republic of letters. British critics class Lowell, Poe, Irving, and Longfellow as our greatest four writers. As compared with Whittier, Lowell and his poetry are the product of the school, the library, and the college. Whether Americans a century hence will rank Lowell above or below Longfellow and the Quaker poet, time alone must determine.

Few minds have been active in so many different directions. He was eminent as a poet, an essayist, and an editor, and scarcely less so as a professor, a diplomatist, and a speaker. For all Lowell was an omnivorous reader of the literature of every land and nation, he was strikingly original. He wrote much and on many topics. Without doubt he was indebted deeply to other writers, but not unduly influenced by them.

See LONGFELLOW; HOLMES; WHITTIER.

QUOTATIONS FROM LOWELL.

The gift without the giver is bare.

Not failure, but low aim, is crime.

For a cap and bells our lives we pay.

Not suffering, but faint heart, is worst of woes.

Yet to have greatly dreamed precludes low ends.

Solitude is as needful to the imagination as society is wholesome for the character.

Those love her (Truth) best who to themselves are true,
And what they dare to dream of, dare to do.

SAID OF LOWELL.

But the very multiplicity of his endowments interfered with the complete expression of any one of them. His talents hampered his genius.—Professor Norton.

His plentiful and original genius was so rich that he was never compelled, like many writers, to hoard his thoughts, or be miserly with his bright sayings.—Stedman.

O Lowell! I first gave to thee
My boyhood's love and loyalty.
My youth took fire at thy word,
And thou my manhood's spirit stirred
To lofty faith and noble trust. —Savage.

But epigrams and puns were the accompaniments, and not the end and aim, of his conversation; his perceptions were keen and just; his reading had been well-nigh universal; and, with his instant power of comparison, his judgments were like intuitions. His discourse often took on an airy and tantalizing form, and wreathed itself in irony, or flowered in simile, or exploded in artifices, until it ended in some merry absurdity. Such play of argument, fancy, humor, word-twisting, and sparkling nonsense was seldom witnessed, except in the talk of the *Autocrat of the Breakfast Table*.—Underwood.

Lowell, a manufacturing city of Massachusetts. It is situated at the junction of the Concord and the Merrimac, twenty-five miles northwest of Boston. An earlier name was Chelmsford. In 1822 the Merrimac Manufacturing Company established a cotton mill here. The name was changed to Lowell in honor of Francis Cabot Lowell, a pioneer in cotton spinning, the first American to make cotton cloth from raw cotton under one roof. There are numerous industries, as the making of hosiery, carpets, furniture, machinery, and ammunition. It is the great center in the United States for the manufacture of bunting for flags. Patent medicines are compounded on a large scale. The chief industry, however, is cotton spinning and weaving. A series of rapids at this point have a descent of thirty-two feet, and are relied upon chiefly for motive power. The factories cover many acres. A living tide of operatives pours in and out of the gates at the opening and closing hours. Every operation in cotton manufacture from the opening of the cotton bale to the boxing up of beautiful goods for shipment to the jobber may be seen to advantage in these mills. The city has spared no pains to maintain efficient municipal departments. Despite the great number of wage earners who do not own homes, the city is an attractive place of residence. A statue to Ephraim Ellsworth, the first soldier to fall in the Civil War, stands near the center of the city. In 1920 the population was reported at 112,759. Nearly half are of foreign birth. The predominating element is French Canadian, attracted by the opportunity to earn wages and lead a sociable life. When the mills were established the operatives were chiefly country girls. Lucy Larcom and many another refined New England woman worked at one time in the mills. The change is a study in social science. See BUTLER; LARCOM; COTTON; CALICO; DYEING.

Lower California, or **Old California,** a long, narrow peninsula jutting into the Pacific ocean and constituting a territory of Mexico, from the main part of which country it is separated by the Gulf of California. The peninsula has an area of 58,328 square miles. It is a mountainous country of volcanic formation. The climate is dry and it is sparsely populated. There are whale fisheries on the west coast and pearl fisheries on the gulf. There are silver mines also, while salt, orchil, and wines are produced. La Paz is the capital. The population of Lower California is about 50,000.

Loyola, Ignatius (1491-1556), founder of the order of the Jesuits or Society of Jesus. He was born in Spain with the enthusiastic and romantic temperament of that race. He became a page at the court of Ferdinand and Isabella, entered the army, and distinguished himself at the battle of Pamplona, where he was captured by the French after receiving wounds which left him a cripple for life. During his confinement and convalescence, his reading consisted of books of devotion and the lives of the saints, which turned his thoughts to a religious life. He formally renounced the world, made pilgrimages to Rome and Jerusalem, returned to Spain and took up a long course of training at the leading universities, finishing up with seven years of further preparation at Paris. Here, in 1534, together with Francis Xavier, and several students, he consecrated himself to the service of the Church and the conversion of infidels. This was the beginning of the famous Jesuit order. By 1540, Loyola took up his residence in Rome, where he served as general of the order till his death.

Lubbock, Sir John, Lord Avebury (1834-1913), an English scientist, financier, and publicist. He was born in London; his father was Sir John William Lubbock, a noted astronomer and mathematician, as well as a prominent banker. The boy studied at Eton, and then entered his father's business in 1848. Six years later he became a partner in the firm; at various times he filled positions of great responsibility in his profession. Lord Avebury won a place in the hearts of London people by his wise judgment and decisive action in public affairs, in which he early became prominent. As a scientist he became an authority on questions of archaeology, or the study of ancient peoples from the monuments, inscriptions, and other evidences they have left, and in entomology, or the study of insects. His text-book on archaeology has never been surpassed by a modern work; his research in entomology yielded valuable results. Some of his books are the text-book mentioned—*Prehistoric Times, as Illustrated by Ancient Remains, and the Manners and Customs of Modern Savages; British Wild Flowers Considered in Relation to Insects; Addresses, Political and Educational; Flowers, Fruits and Leaves; Pleasures of Life; Use of Life; The Scenery of England,* and *Ants, Bees and Wasps.*

Lübeck, one of the three free cities of the German Empire. It is situated on the Trave River, nine miles from the Baltic. The channel of the river has been deepened. The city is near the northwest angle of the Baltic. The corresponding town on the North Sea side of the peninsula is Hamburg. The two cities are but thirty-eight miles apart. The ancient walls have been leveled to form pleasant promenades. Four of the principal gateways have been left standing. The principal of these is the Holstein Gate, a massive brick structure with two lofty towers, quite medieval in aspect.

Lübeck was made a free imperial city in 1226, and thirty years later it became the head of the Hanseatic League. The old Rathhaus or city hall, a Gothic brick building with huge gables and quaint spires, still stands. The audience chamber in which ambassadors were heard, the war chamber with beautiful carved wood paneling, and the ancient Hanseatic Hall in which the diets of the league were held may all be seen. The last named has been cut up into small offices for city use. A restaurant or wine cellar under one corner of the building was formerly a place of fashionable resort. The chimneypiece in the room where wedding feasts were held bears the quaint inscription in German, "Many a man sings loudly when they bring him his bride. If he knew what they brought him, he might well weep." The use of brick as a building material has given the architecture of Lübeck a plain, clumsy appearance. The council house, cathedral, and principal churches lack the flying buttresses that give a building a light appearance. There is also a want of the rich sculpture that adorns the Gothic buildings of England, France, and other localities where stone was used. The interiors of the Lübeck buildings are spacious and imposing. They are characterized by lofty vaulting. Rich decorations in tile, and fine old wood carvings are seen.

The city with its adjacent territory of 116 square miles is governed by a Senate of fourteen members and a House of Bur-

gesses of 120 members. It is represented in the imperial Parliament. A large trade is carried on with ports on the Baltic. Railroads and canals connect the city with the interior of Germany. An extensive wine trade is maintained direct with Bordeaux, France. The wine cellars of Lübeck are perhaps the largest in Germany. Population in 1919, 113,071.

Lucerne. See ALFALFA.

Lucerne, loo-sĕrn′, the capital of the Swiss canton of that name. It lies at the outlet of the Lake of Lucerne. It is still inclosed by medieval walls and watch towers erected in 1385. An amphitheater of hills behind the town, with the lake in front, and the Rigi, Pilatus, and the mountains of Uri in full view, give the city a position of surpassing beauty. The Reuss is a clear, emerald green stream. It leaves the lake with a velocity surpassed only by that of the Rhone at Geneva. It is crossed by four bridges. The newest is an iron structure designed to meet the commercial necessities of the city. The bridges of interest, however, are narrow wooden affairs that cross the stream on piling. They are inclosed and roofed. The interior of the Chapel Bridge is painted with 154 scenes from the lives of the patron saints of Lucerne and from Swiss history. At the middle of the river the bridge passes a picturesque old water tower in which the municipal archives are arranged. It is said that this tower was once called the Lucerna or lighthouse, whence the name of the city. The Mill Bridge is also roofed. The interior is likewise adorned with paintings known as *The Dance of Death.* The river and lake are enlivened with swans and half tame waterfowl. One hundred thousand tourists are said to visit the city annually. The surrounding scenery is too attractive to permit much attention to be given to the antiquities of the city. An old city hall contains good carving. A historical art and industrial museum contains relics of pre-historic and medieval periods, a collection of antiquities from the lake dwellings, and many other interesting exhibits. The present population of the city of Lucerne is about 44,029. For a description of the Lion of Lucerne, see THORWALDSEN.

Lucerne, Lake of, a famous lake of Switzerland. It is bounded by the four forest cantons of Uri, Schwyz, Unterwalden, and Lucerne. It lies at a level of 1,406 feet above the sea. It is nearly cruciform in shape, with the Bay of Lucerne at the top and the bay of Uri at the foot. The extreme length is about twenty-three miles. The extent of the arms is about twelve and one-half miles. The general width is from one to two miles. The greatest depth is 900 feet. Steamers from Lucerne make the grand tour of the lake daily. The road of Axenstrasse, cut in places through the solid rock along the eastern shore of the lake, is one of the most celebrated lake drives in Europe. The lake is so narrow and lies so deep among the mountains that the winds shift with dangerous frequency, making navigation unsafe except for experienced boatmen. The shores of the lake are intimately associated with the legend of William Tell. A storm of the sort mentioned, it may be remembered, was the means at one time of his escape from his captors. See LUCERNE; TELL; URI; ST. GOTHARD; RIGI, etc.

Lucian, lū′shĭ-an, a Greek satirist of the second century. He was a native of Samosata, Syria. He studied law and rhetoric and traveled through many countries lecturing. His writings include poems, romances, and dialogues, as well as critical works and biographies. Many of his writings are preserved, the best known among them being *Dialogues of the Dead* and *Dialogues of the Gods.* Lucian was a freethinker. He made religion an object of ridicule, and thereby won the nickname of "The Blasphemer." A current legend, but one without foundation, was that he was torn to pieces by dogs—a just punishment, it is to be supposed, for his blasphemy.

Lucifer, a name by which the ancient Romans designated the planet Venus, when it appeared as a morning star. Phosphorus is the Greek name. When this planet appeared as an evening star the Romans called it Vesper, the Greeks, Hesperus.

In Isaiah xiv: 12, the king of Babylon is addressed figuratively as "Day-star, son of the morning." In translating into English, the Hebrew word day-star was ren-

dered by the old Latin name of the morning star, Lucifer. From a misunderstanding of the passage the name Lucifer was identified with that of Satan, and is so used by Milton in *Paradise Lost.*

Lucknow, a city of British India. It is situated on the Gumti River, a branch of the Ganges. It is the capital of the province of Oudh. In size, it is the fifth city of India, having a population in 1921 of 243,553. It is a seat of important manufactures of gold and silver brocade, muslin, and other Indian wares. During the Indian mutiny of 1857-8, Lucknow made a determined defense. When the garrison had reached the last stage of exhaustion it was relieved by a column under General Havelock, September 26, 1857. Whittier has immortalized the raising of the siege in his poem, *The Pipes of Lucknow.* See HAVELOCK.

Lucretius, a Roman poet. About 97-53 B. C. Little is known of his early life. He is thought to have studied at Athens with the Epicureans. Of his writings, only one is left, a didactic poem, *De Rerum Natura,* Concerning the Nature of Things. It is an exposition of Epicurean philosophy, reminding the reader somewhat of Pope's *Essay on Man.* The leading doctrine is the thought that death should not be feared. Lucretius had the encouragement of Cicero. He is considered to have shown ability, even genius, in clothing philosophy, rather intractable material, with the dress of poetry. See LATIN.

SAYINGS.

Continual dropping wears away a stone.

What is food to one man may be poison to another.

Lucy, Sir Thomas, a gentleman in the vicinity of Stratford who is said to have had the young Shakespeare and his boon companions up before him for poaching in his deer park. Sir Thomas is considered the model for Shakespeare's Justice Shallow in *Ye Merry Wives of Windsor.*

Ludendorff, General Erich von (1865-), a German military expert who was known for a time during the World War as the "German Napoleon," and who is credited with forcing the break between the United States and Germany. Born in Posen, Prussia, he was graduated from the War Academy in 1895 and was soon appointed to the Great General Staff in Berlin. General Ludendorff's remarkable mental powers soon won him recognition, and he labored indomitably for the perfection of a powerful fighting machine. In 1912 he was made chief of a department at the staff headquarters with the rank of colonel, and in 1914 was given command of an infantry brigade at Strassburg with the rank of major. Ludendorff was made chief of staff of the 8th army under Hindenburg. From this time forward General Ludendorff was the dominant figure in Germany, at times overshadowing Hindenburg and even the German Emperor. Many authorities have said that General Ludendorff was the brain and Hindenburg the arm of the German military forces. He dictated the policy of Germany and her allies and trafficked with the Bolsheviki; but it was he, also, who prompted the request of Germany for an armistice.

Luke, Saint, the author of the Third Gospel and of the Book of Acts in the New Testament. In the Book of Acts are recorded many events of the time in which Saint Luke lived. He is the "beloved physician" who accompanied Paul on at least two of his missionary journeys. Saint Luke was born in Antioch, of Gentile extraction, and was a physician by profession. He became a believer in Christ, and when Paul sailed from Troas to Philippi on his second mission tour, Saint Luke accompanied him. Saint Luke also accompanied Paul on his last journey to Jerusalem, and because of his medical training was of great assistance to the Apostle. Saint Luke was a man of culture, and a brave, warm-hearted worker in the cause of Christianity. The time of his death is not known.

Lumbago, a form of muscular rheumatism affecting the muscles and tendons of the lumber region, that is, of the loins and small of the back. The attacks of this disease are often very sudden, coming on in the form of excruciating pain when the victim attempts to rise from a sitting or stooping posture, or to turn himself in bed. The treatment demanded is rest of these muscles, preferably in bed, with application of heat and the use of anodyne

Mill Pond, Pollock, Louisiana

Saw Mill, Palouse, Washington.

LUMBERING SCENES

liniments. In advertisements of patent medicines the symptoms so often ascribed to serious affections of the kidneys are for the most part symptoms of this painful but not dangerous disease. The more common kidney diseases are unaccompanied by pain in the back.

Lumbering, an American term for the industry of cutting trees in the forest and preparing the trunks for market. The products of lumbering are logs, shingles, bolts, stave bolts, rails, fence posts, telephone and telegraph poles, cordwood, spruce, and poplar cut to lengths for the pulp mills, masts and spars, ship knees, railroad ties, shakes, cooperage, hop poles, hoop poles, handle stock, and other rough forms of timber. By way of distinction, the term lumber is applied to the boards and dimension stuff produced by a sawmill, while the term lumber products includes the foregoing as well as sash, doors, and other articles turned out by the planing mill and the factory. The term lumberman is applied indiscriminately to one who logs in the forest or who operates a sawmill, for a firm of lumbermen is likely to engage not only in lumbering, but in sawing, and very possibly in the establishment of retail lumber yards in which the product of the sawmill is offered for sale.

Lumbering is a world-wide industry. The lumber yards of China and Japan are occupied largely by piles of bamboos assorted to length and size. The Filipinos cut not only bamboos but valuable forest trees for export trade. The elephant is used in southeastern Asia to drag teak logs from the forest. Australian lumbermen find wealth in forests of eucalyptus. Valuable woods are obtained in the forests of the Amazon. Argentina supplies the world with quebracho. Central America and the West Indies ship mahogany. Forestry and the attendant operations of reducing forest trees to lumber have been reduced to a science in Europe. Stout English oak is noted the world over, and, not to be prolix (for the ringing sound of the ax and the crash of falling trees are unceasing), the Scandinavian countries supply the shipbuilder and the carpenter with fir and pine of high quality.

American lumbering began in Maine. Before the Pilgrims set foot at Plymouth the tall white pines on the islands and the coast of Maine were in demand for masts. The early colonists of the Atlantic coast from Massachusetts to Georgia became expert in the use of the ax, in felling trees, and in building log houses. The methods of lumbering developed in the forests of Maine may be said to have extended throughout the white pine and winter snow region from the North Atlantic coast to Minnesota, including the adjacent parts of Canada. Lumbering is one of the picturesque and enticing occupations. Passing by the neighborhood sawmill and the local supply of logs, we may say of the lumberman who has swept away the pine forests of the region named that he saws in the summer time and logs in winter. The sawmills, which at an earlier day were driven by water power, are now operated largely by steam. They are situated on rivers or lakes, it may be hundreds of miles below the headwaters of a district abounding in the coveted hemlock, spruce, or pine. In the autumn the lumberman establishes his camp in the very heart, it may be, of the tract he proposes to cut over. He builds low, broad, frost-proof, or, at least, warm log buildings, roofed usually with tarred paper. A typical camp includes a kitchen and eating house, combined with sleeping quarters for the cook and the "cookee"; a sleeping house provided with tiers of bunks for the men; a shop for the mechanic who mends sleds and provides handles for the tools; stabling for teams; and, very possibly, a cabin for the foreman. A camp favorably situated as to the supply of timber may serve for several years. Not infrequently a number of camps are maintained by the same firm and are kept in provisions, baled hay, and horsefeed by "tote" teams from an accessible center where a warehouse and an office are maintained.

As early in autumn as the swamps are frozen over, and without waiting for snow, logging operations begin in earnest. The men around a logging camp are dubbed lumberjacks rather indiscriminately; but, as a matter of fact, they are punctilious as to their duties. The teamster, for instance,

drives his team faithfully and will not allow another to handle his lines; but he would see the camp in smoke before he would seize a cant hook and roll logs on the skidway or carry in an armful of firewood for the cookee. The entire business is systematized. One set of men fell the trees and saw the trunks into suitable lengths or logs. The swampers cut roads. Men and teams are employed to snake the logs to the roadside, where they are piled up on skidways. Ere the ground be frozen, a broad level road is built to the nearest watercourse. Hills are graded, often at heavy expense. As far as possible the route follows swamps, as they afford a level, solid roadway in winter. Strong sleds of unusual width, and provided with wide bolsters, are used in hauling. Teams, usually of four heavy horses are employed. Enormous loads of logs built up to twice the height of a man are hauled from the skidways to the stream where they are banked until the waters rise in the spring. Here the amount of lumber in each log is measured by a scaler, and each log is marked by one or more blows on the end, given with a sledge or marking hammer having raised letters or other marks on its face. These log marks, together with the bark mark of the camp, cut by the loggers in the bark with an ax before the log leaves the skidways, serve to proclaim the ownership of the log when afloat. A floating log unmarked is the property of the finder, but a log properly marked is personal property and is protected by law, even though a freshet carry it into the dooryard of a farmer and leave it stranded there. The rivers are full of sunken logs.

When the break-up comes in spring, men and horses hurry out of the woods before the swamp roads become impassable. The camp is abandoned unless, indeed, a caretaker is left to hunt, fish, fight mosquitoes, herd oxen, or raise a patch of potatoes for future use. Meanwhile the logs on the bank are rolled into the swollen streams to float down to the mill. Drivers, men wearing boots set with spiked nails to prevent slipping, and carrying long pike poles with which to push, pull, and guide the logs, follow down the stream and keep the logs going. Points where logs are likely to lodge are guarded. Sometimes, in spite of effort, a jam forms and the logs collect, filling the stream from shore to shore. The breaking of a jam is dangerous work. Sometimes a hardy driver ventures out to cut an obstructing log. Sometimes the forefront of the mass of logs is blown up by a charge of dynamite. Sometimes a drive is hung up because the water goes down, and sometimes a freshet carries the logs far out into the river bottom, where they go ashore unless piloted to midstream by the drivers. The driver learns to cross a stream by jumping from log to log and to walk a rolling, bobbing log, or, if able to stab a neighboring log with his pike pole, the two logs form a raft on which he journeys unconcernedly.

In case logs are hauled to a lake they are unloaded on the ice, and are surrounded by a boom consisting of long logs laid end to end and linked together by boom chains. When the ice goes out, the boom with its contents may be towed to its destination or to an outlet having a current. Lumbermen find it advantageous to combine in driving. Usually a leading logger undertakes to drive his own logs and at the same time drive the logs of his neighbors at a price agreed upon. The driving in the upper Mississippi, for instance, as far down as the Falls of St. Anthony, is accorded to a single driving company. The various loggers bring their small drives down the tributaries and turn them into the main stream to be driven by a large crew under foremen who have made a specialty of the Mississippi drive for a half of a century. The uncertainty of a favorable stage of water, the loss of logs from sinking, and the delay in delivery has led to the building of logging railways to take the place of the small streams. Logs are loaded on flat cars, usually by a steam derrick.

Lack of snow in the South Atlantic and Gulf states has necessitated the employment of somewhat different methods. Snaking is done on the bare ground, or else one end of the log is suspended beneath the axle of a two-wheeled cart. Steam drums mounted on flatboats, anchored at the edge of a lake or river, are used to wind up cables and drag logs for half a mile or more through

the swamps into open water. This is a customary way of getting cypress afloat. Logging railways and steam derricks for loading take the place of river driving almost exclusively in the Southern hardwood and yellow pine districts.

The timber of the Pacific coast grows to such an enormous size that special methods are employed. The trunks are so large that the workmen erect staging in order to cut above the swollen knees of the stump. Stumps ten and even fifteen feet high are not infrequent. The logs are too heavy for team work. They are drawn to the skidways by stationary donkey engines and cables. In case of distance, the logs are taken forward by successive cables to the sidings, where they are rolled upon flat logging cars by steam power. A feature of the lower Columbia is the building of enormous rafts for shipment. The logs are first built or piled within an oval frame cradle larger than the hull of a Dreadnought. They are then bound together with chains forming a huge oval fagot stout enough to withstand the buffeting of ocean waves. These great rafts are towed to San Francisco and other coast points, where the logs are converted into lumber.

Logs are cut, driven, bought, and sold at a price based on the number of board feet of lumber they will make. A cruiser reports the standing timber or stumpage on a certain tract at, let us say, 100,000 feet; the scaler reports 90,000 feet of white pine on the bank; the manager of the drive charges for 80,000 feet delivered in the boom at the sawmill; the foreman of the mill reports a season's cut in feet—all meaning board feet. The buyer and the seller may agree on the number of feet, but the usual method is to call on an official scaler to measure up the logs. In a district where farmers and small loggers own timber, the lumberman buys logs, usually at a price per thousand (feet of course) banked.

Some idea of the extent of the lumbering industry may be had from the statement made by the *American Lumberman* that, between the landing of the Pilgrims and the close of the nineteenth century, 1,000,000,000,000 feet of lumber was sawed in the United States and Canada. Prior to 1850 the northeastern part of the Union led in the production of lumber. About the date last named, the lumbermen attacked the white and Norway pine forests of the Great Lakes in earnest. During the period 1830-1897 the pine cut of Michigan, Wisconsin, and Minnesota was not less than 286,000,000,000 feet, or, if we add 75,000,000,000 feet of hardwood, the three states named contributed not less than 363,000,000,000 feet of lumber to build farmsteads, towns, roads, and bridges. By 1905 the Southern States led in the production of lumber. In 1910 it was estimated that the Pacific coast was contributing a fifth of the total lumber supply. The cut of the Northeastern States is now largely second growth. The original forests of the Great Lakes region are about gone. The western states have gained rapidly on the South and at the present time lead in the output of lumber.

In 1905 the United States authorities took the most exhaustive and authentic census of the lumber industry that has been made to date. According to this report (1905), the lumbering states ranked in magnitude of cut, as follows: Washington, Louisiana, Wisconsin, Pennsylvania, Arkansas, Michigan, Mississippi, Minnesota, Texas, Georgia, Alabama, California, North Carolina, Virginia, West Virginia, Florida, Oregon, Maine, Missouri, Tennessee, South Carolina, New York, New Hampshire, Kentucky, Ohio, Vermont, Indiana. The following statistics are chiefly from this report; the figures do not include farm operations:

Logging camps	12,494
Capital	$90,454,494
Timekeepers, clerks, etc.	3,953
Salaries	$3,673,000
Wage-earners	146,596
Wages	$66,000,000
Keep of teams	$12,212,000
Stumpage, thousand feet, board measure	27,940,097
Average stumpage value per thousand	$2.59
Stumpage value, total	$72,347,000
Scalers' figures, thousand feet board measure	27,980,000
Railway ties	36,445,000
Telegraph and telephone poles	2,080,482
Fence posts	17,483,268
Hemlock bark, cords	391,691
Oak bark, cords	69,873
Number of sawmills	18,227
Capital	$381,000,000

Wage-earners	223,000
Wages	$100,310,000
Lumber, mill value	491,524,000
Lumber Output—	
Rough lumber, thousand feet	34,135,139
Shingles, thousand	14,547,477
Lath, thousand	2,647,847
Cooperage—	
Hoops, thousand	546,879
Staves, thousand	2,464,689
Headings, thousand sets	125,354
Cut in board feet, 1918.	
Yellow Pine	9,919,351,000
White Pine	1,946,988,000
Oak	152,026,000
Hemlock	1,686,904,000
Western Yellow Pine	1,701,969,000
Spruce	912,344,000
Maple	646,885,000
Gum	593,296,000
Cypress	596,291,000
Chestnut	324,382,000
Birch	307,409,000
Larch	333,178,000
Beech	685,284,000
Yellow Poplar	232,182,000
Cedar	226,586,000
Tupelo	191,521,000
Basswood	161,165,000
Elm	155,082,000
Cottonwood	129,125,000
Ash	112,521,000
Hickory	75,010,000
Walnut	85,682,000
White Fir	199,056,000

The total production of lumber in the United States in 1919 was 34,552,076 thousand feet board measure, as compared with 37,346,023 M feet in 1914, and 44,509,761 M feet in 1909; these figures showing the steady decrease in annual production. It is believed that the crest of lumber production in the United States was reached in 1909.

Estimates made by the Forest Service indicate a total yearly growth in the forests of the United States of less than seven billion cubic feet, or not to exceed 12 cubic feet per acre; while the annual cut of timber, not including loss by forest fires, is more than four times the growth. The need for conservation of our timber resources is therefore self-evident. The annual per-capita consumption of lumber in the United States, which is over 300 cubic feet, greatly exceeds that of any other country, being eight times as much as that of Germany and twelve times that of France prior to the war.

The states producing more than one billion feet of lumber in 1919 ranked in the following order: Washington, Louisiana, Oregon, Mississippi, Alabama, Arkansas, North Carolina, Texas, California, Florida, Wisconsin and Virginia. The leading state, Washington, produced nearly five billion feet, and Louisiana over three billion feet; while the former great lumber states of Michigan and Minnesota were fourteenth and eighteenth respectively in point of production. The number of active sawmills in 1919 was 29,534, as compared with 46,584 ten years before.

Consumption of timber in 1919 in by-products was as follows in the United States:

Veneers, 576,581 M feet, worth $25,104,164, including red gum, yellow pine, birch, cottonwood, tupelo, yellow poplar and white oak, with smaller quantities of maple, walnut, spruce and other woods.

Dyestuffs, 950,275 tons of wood, worth $12,133,799, of which chestnut supplied 754,972 tons. This timber came mainly from Virginia, Tennessee and North Carolina.

Tanning, 609,130 tons of wood and bark, worth $12,027,687, mostly oak and hemlock.

Extracts, 794,360,977 pounds of wood, worth $34,579,165, mostly chestnut, quebracho, oak, spruce and hemlock.

Wood used in distillation, 1,442,675 cords, of which hardwoods, mostly beech, birch and maple, supplied 1,186,477 cords. Wood alcohol, charcoal, acetates, tar and tar oils are distilled from hardwoods. Wood alcohol produced for sale in 1919 totaled 6,980,693 gallons. Rosin, turpentine, tar, tar oils, charcoal and wood creosote are distilled from soft woods.

Of the total cut of 34½ billion board feet of lumber in the United States in 1919, yellow pine contributed 13 billion feet, Douglas fir nearly 6 billion feet, oak about 2¾ billion feet, and western yellow pine, hemlock and white pine about 1¾ billion feet each, the production of white pine having sunk to sixth place.

The value of forest products of farms in 1919 was nearly $400,000,000, of which more than half was sold by farmers and the remainder used on farms. The area

of merchantable timber on 946,871 farms in the United States in 1920 was estimated at 35,270,527 acres.

In 1921 there were produced in the United States 1,724,078,000 laths and 9,192,704,000 shingles.

Wood pulp is now of great importance in paper manufacture, but the United States imports from Canada a large part of its supply for this purpose. In 1921 the imports amounted to 697,100 net tons.

The original forests of the United States covered about 822,000,000 acres and contained 5,200,000,000,000 board feet of timber. It was estimated as of June 30, 1922, that there are left 357,303,000,000 acres of forest land, containing 2,215,000,000,000 board feet. Of this, 137,000,000 acres are in virgin timber; 112,000,000 acres are in culled and second-growth timber large enough for sawing, 133,000,000 acres are partially stocked with smaller growth, and 81,000,000 are devastated and practically waste land.

Lumpy Jaw, or **Actinomycosis,** a disease of common occurrence among cattle, swine, and other animals, and known also to afflict man. It is due to infection by a vegetable parasite known as the Ray fungus, which lives among grasses and other plants. It is believed that cattle take in this micro-organism with their food. Of the comparatively few cases known among human beings, the majority have occurred in men whose work led them to handle cereals. It is thought also to have been contracted by the eating of raw meat. The seat of affection in both man and animals is usually the mouth and passages thereto; sometimes other parts of the head are affected or the lungs or intestines. In fact the disease may occur in any organ, or in the bones. The fact that the disease more often affects the mouth has given rise to the popular names for it, such as lumpy jaw, wooden tongue, and big head. The disease is of slow development, the fungus penetrating the tissues gradually, causing the growth of new connective tissue in the form of tumors, which have been mistaken frequently for cancerous or tubercular tumors. Potassium iodide is regarded as a specific for this disease, although surgical treatment is necessary in many cases.

Luna. See DIANA.

Lunacy. See MOON; INSANITY.

Lund, a historic city of Sweden. It is situated about eight miles inland in the laen of Malmo, twenty-three miles by water and land east of Copenhagen. There are about 20,000 inhabitants. The surrounding country is agricultural. Glove-making and foundry work are important local industries. Lund is a city of interesting historic associations. It is the Londinum of the Goths. Medieval kings of Scandia were elected on a hill in the vicinity. The cathedral of Lund, a Romanesque structure recently restored, has been pronounced the finest specimen of ecclesiastical architecture in Scandinavia. The University, attended by 700 students, has modern buildings, a museum, and a library of 180,000 volumes. The poet Tegner was a professor at Lund. A statue has been erected in his memory.

Lundy's Lane, Battle of, an engagement fought in 1814 on the roadway known as Lundy's Lane, about one and a half miles from Niagara Falls on the Canadian side. The opposed forces were an American detachment under General Scott and later under General Jacob Brown and a superior force of British commanded by General Riall. The Americans were stationed at Chippewa, when on July 25 General Brown ordered General Scott to advance with about 1,300 men toward Queenstown (now Queenston). This detachment met the British about two and a half miles from Chippewa. Scott attacked vigorously, turning the British left and taking some prisoners, including General Riall. Fighting continued until midnight. Both Scott and Brown were wounded; General E. W. Ripley took command, and was confronted by British reenforcements. He held the field for an hour or more, and then withdrew his men to the original American position. The total number of men engaged was 4,500 British and 2,000 Americans. The American losses were heaviest, but both sides claimed a victory. This was the last important battle of the War of 1812.

Lunenburg, Nova Scotia, situated on the Atlantic coast, seventy miles southwest of Halifax and on the Canadian National Railways. It is the county town of Lunenburg County and is a fishing and manufacturing center of some importance. The fishing fleet comprises about 150 vessels, and there are manufactories of stoves, cement, building blocks, machine shop and foundry products, gasoline engines and sails, and there is a ship yard. Besides the public schools, Lunenburg contains a county academy, a library and a large park. In 1921 the population was 2,792.

Lungs, in man, a pair of organs playing the principal part in breathing. They are inclosed in the chest, an air-tight chamber cut off from the abdomen by the diaphragm. One lung is situated on the right side of the heart; the other on the left. Air entering the nose or mouth enters the lungs by means of a gristly windpipe or trachea. The windpipe branches at its lower end. The lungs are very light in structure, weighing not to exceed one-thirtieth to one-fiftieth of the body. The lungs of an adult male weigh between forty and fifty ounces; those of a female from twenty-eight to thirty-five ounces. In structure, the lungs are composed chiefly of air cells, having thin walls in which blood capillaries are spread out. All the blood of the body passes through these capillaries many times during an hour. By action of the diaphragm, which converts the lungs into a sort of bellows, air is inhaled and exhaled. The walls of the capillary are so thin that oxygen passes from the air through them into the blood. The blood gives off carbon dioxide through the walls into the air spaces. The air thus vitiated is driven out of the lungs and is replaced by fresh air. The more deeply one breathes, the more complete the change of air in these sacs. For this reason physical exercises designed to expand the chest are helpful. The process of breathing and purifying the blood must be kept up night and day, sleeping or waking. One who is deprived of air is said to be smothered. The lungs of all air-breathing vertebrates are much alike. The butcher speaks of an animal's lungs as the lights. See AIR.

Nothing is more interesting than the body's methods of economy. For instance, in its work of taking in oxygen and throwing off carbondioxid, it needs space, surface. And so there has been evolved a method by which in the lungs the inhaled air reaches a surface of sixteen hundred square feet. The peculiar little openings, or vesicles, by which this economy of space is gained are six hundred millions in number. There passes into and out of the lungs in one day no less than four hundred cubic feet of air. Each outgoing breath contains two cubic inches of carbondioxid, and contaminates five thousand cubic inches, about half a barrel of air. The lungs exhale every day an amount of carbon that if caught and solidified would about equal a lump of coal weighing half a pound.

The air breathed out is moving at a speed of forty-three inches a second, and is inhaled at a speed of fifty-two inches a second. In a sudden intake of breath, as in a sob or gasp of surprise, the speed of the inhalation may be much greater, —ten or even twenty feet a second.

The external surface of the body has an area of about twenty square feet, and contains seven million minute openings, perspiratory glands, out through which the blood pushes certain of its poisonous ingredients.

The skin has a respiratory as well as a perspiratory function. Through a healthy skin we take in about one-sixth as much oxygen as through the lungs. Dr. Woods Hutchinson, *What the Lungs Do,* in *Sunday Magazine.*

Lupine, lū′pĭn, a group of herbs, sometimes shrubs, belonging to the pea family. A few grow in the Mediterranean region and in eastern United States, but most of the eighty or more species are found in western North America. Lupines send up white, yellow and blue flowers.

Luray Cave, a celebrated cave in Page County, Virginia, seventy-eight miles southwest of Washington. The cave is in the Shenandoah Valley under the western spurs of the Blue Ridge Mountains. The cave consists of numerous chambers in a limestone formation. Striking stalactites abound. The extensive chambers and passages were explored in 1878. While not so well known as the Mammoth Cave, the Luray Cave is considered quite as wonderful. Electric lights reveal a fairyland of marvelous reds, browns, yellows and other colors.

Lusiad. See CAMOENS.

Lusitania, a district of ancient Hispania, according to Strabo, the country occupied by the Lusitani, was bounded on the south by the Tagus and on the north and

west by the Atlantic Ocean. It was a rich and prosperous country, and had valuable gold and silver mines. Its people were wild, brave and warlike, and some of them, especially those living in the mountains, were addicted to plunder. Their chief, Viriathus, after a long struggle, was at last, through treachery, defeated by the Consul Caepio (about 140 B. C.). Soon after the Lusitanians were finally subdued.

Lusitania, a transatlantic liner, that was sunk by a German submarine on May 7, 1915. She was torpedoed off Kinsale Head, Ireland, and sank in less than 20 minutes. Eleven hundred and fifty persons lost their lives, among the number being 114 citizens of the United States.

Lute, a stringed musical instrument, somewhat akin to the guitar, mandolin, or banjo. Historically it appears to be an evolution from simple instruments known to the Egyptians and Hebrews. It was introduced into western Europe by the Arabians, where it became popular during the Middle Ages, being used by a singer as a minstrel uses his banjo to play an accompaniment. The lute of antiquity had but five or six strings; the modern lute has twenty-four. The player strikes or plucks the strings with the fingers of the right hand and regulates the notes by pressing the strings against frets with the fingers of the left hand.

Luther, Martin, a noted German religious reformer. He was born at Eisleben, Saxony, November 10, 1483. He died at the same place February 18, 1546. His father, Hans Luther, was a slate cutter in humble circumstances. Martin showed so much aptitude for learning that his father determined to make him a lawyer and managed to send him to a school at Eisenach. Martin had a fine tenor voice and gentle manners. After the fashion of the time, he, with other poor scholars, sang under the windows of the wealthy for alms. He studied Latin, Greek, and philosophy at the University of Erfurt, taking his master's degree in 1505. The cathedral preacher, Dr. Weinmann, gave him a love for the study of the Scriptures.

Various circumstances, including, no doubt, his personal inclinations, led Luther, to his father's despair, to give up the study of law and become a monk. He entered the Augustinian Convent of Erfurt in 1505, taking with him his Plautus and his Virgil. Here he secured for the first time a complete edition of the Bible. In 1508, at the suggestion of his superiors, he was appointed professor in the University of Wittenberg, then an institution but five years old. He lectured first on Aristotle. In 1509 he gave lectures on the Bible. His class room was thronged with students. In 1511 he made a trip to Rome, and on his return was made a doctor of divinity. He continued to expound the Scriptures, which, it should be remembered, were at this time little known outside of monastic circles. He appears to have made numerous short tours, preaching in the various churches in Thuringia.

In 1515 John Tetzel, a Dominican monk, passed through Saxony, granting indulgences. Luther was much stirred up. He wrote to the various princes, urging that permission be refused Tetzel. When the latter reached the vicinity of Wittenberg, Luther drew up ninety-five objections, statements, or theses, denouncing indulgences, and on Hallowe'en, October 31st, nailed the paper to the door of the castle church where clergy, citizens, and students might read. The indulgences granted remission of punishment in purgatory and were erroneously confounded then and later with pardon for sin. They were bestowed by an express authorization of the archbishop of Mainz, under whose direction Tetzel preached. Luther's course was one of open defiance and rebellion, not so much against the church as against an eminent authority. Whatever view be taken of Luther's theology, the act was a bold one. Copies of his theses were multiplied and spread abroad.

It does not appear as yet, however, that he contemplated secession from the church. He was still an Augustinian monk and a professor in a Catholic university. He preached in various cities of Germany, defending his theses. He was soon, however, accused of heresy, and commanded to appear before the pope at Rome. The elector of Saxony, a patron of the university, arranged, however, for Luther's appearance before the papal legate at Augsburg instead. The interview was not satisfactory. The

cardinal wrote, "I can dispute no longer with this beast. It has two wicked eyes and marvelous thoughts in its head." Luther stole away, fearing arrest. Later Luther met a more conciliatory representative of the pope, and wrote the Holy Father a letter in which he "freely confessed that the authority of the church was superior to everything, and that nothing in heaven nor earth can be preferred before it, save only Jesus Christ, who is the lord of all."

It was understood that the question of the indulgences should be dropped on both sides. John Eck, however, an old antagonist of Luther, published thirty theses attacking him. This led, in 1519, to a public disputation at Leipsic between Eck and Luther. Eck accused Luther of arguments and a course of conduct similar to those of Wyclif and Huss. Luther replied with much heat. At this time it became apparent to both parties that a serious controversy was at hand. The papal college at Rome felt that it would be necessary to put down Luther and his sympathizers with a strong hand; while north of the Alps the sentiment was, "Germany for the Germans." Zwingli, a Swiss reformer in sympathy with Luther's doctrines, raised the cry, "Why should 300,000 florins be sent every year from Germany to Rome?" As a matter of fact, the controversy took on in part the form of a struggle between the Italian and the German branches of the church.

June 15, 1520, the pope published a bull at Rome excommunicating Luther. Luther answered with a pamphlet in which he called the pope Anti-Christ. December 10th of the same year, he headed a procession of professors and students and passed out of the Wittenberg city gate to an open place where he laid a copy of the bull on a bonfire. An assistant professor threw copies of the rules of the church into the same fire. Public proclamation was made that the University of Wittenberg had broken away from the Church of Rome. The example was followed in many parts of Germany. The pope appealed to the emperor, Charles V, to suppress the heresy. The latter summoned Luther to appear before a diet to be held in the city of Worms, giving him a safe conduct for that purpose. Luther's friends urged him not to go to Worms, fearing that he might suffer the fate experienced by Huss and Jerome at Constance 100 years earlier. The Parliament of the empire met in January, 1521. The Italian legate suggested that Luther be condemned unheard, as one already under sentence by the pope's bull of excommunication. In return the German princes presented a list of 100 grievances of the German nation against Rome, thus exposing the national character of the controversy.

April 16th, Luther was brought before the Diet. His books and writings were piled up on a table before him. He was asked whether the writings were his, and, if so, whether he would retract them. Instead of retracting, he made a long speech declaring it a matter of conscience not to take back what he believed. He was permitted to retire. The Diet pronounced an edict of condemnation, which meant that as soon as his safe conduct expired, he would be an outlaw. On his way homeward through a vale in the vicinity of Eisenach, he was seized by a party of horsemen with an apparent show of violence. They were really his friends in disguise, sent by the Elector of Saxony. They conducted him to the Wartburg, a fortress on a high hill overlooking Eisenach. Here he was concealed for ten months. His room, writing table, inkstand, and other personal belongings are still shown.

Here he began the translation of the Scriptures from Hebrew, Latin, and Greek into German. The New Testament appeared September 21, 1522. We may anticipate a little by saying that the Old Testament appeared a few years later. Luther stated from the first that the translation must be couched in the homely language of the German people, so as to be understood by the mother, the children, and the goodman of the house. "We are laboring hard," wrote he, "to bring out the prophets in the mother tongue. Ach, Gott! what a great and difficult work it is to make the Hebrew writers speak German. They resist it so, and are unwilling to give up their Hebrew existence and become like Germans." The language used by Luther in his German Bible has become the literary

language of Germany. Other forms of German have become dialects.

In the spring of 1522 Luther resumed his chair at Wittenberg. A diet held at Nuremberg in the same year reversed the Edict of the Diet of Worms. Events moved on rapidly. Rioting arose in various parts of the empire. A peasants' war broke out. Southern Germany decided to adhere to the Roman Church. The Reformation was crushed out in Austria-Hungary and Bavaria. Luther's later life was devoted to preaching and writing. In 1522 alone, he issued, it is said, 130 treatises and eighty-three in the year later. In fact, though not in name, he became a sort of pope for north Germany. He issued catechisms, directions for public and private worship, a church hymn book, directions for baptism, the communion, marriage, and other sacraments. The peasantry were illiterate and miserable beyond all description. They had been subjected to the extortion of princes and petty lords for centuries. He issued addresses and made personal appeals to the citizens and princes everywhere to provide schools for the children of the common people. He prepared a popular edition of *Aesop's Fables* for school use.

Luther was fond of music and was a poet of no mean order. *Ein Feste Burg* and *Aus Tiefer Noth* are found in all standard collections of German hymns. In 1525 Luther married Katharina von Bora, a nun who had left a cloister as he had left a monastery. As the vows of a priest and monk, as well as those of a nun, pledge the taker to remain unmarried through life, he has been criticized severely by his opponents for this act.

At Luther's death his remains were brought to Wittenberg, where they now rest beneath a brazen slab in the old Castle Church. The wooden doors of the church were burned in 1760. In 1858 Frederick William IV replaced them with bronze doors, ten feet high, bearing the text of the ninety-five theses. The house in which Luther lived was converted into a Luther Museum in 1883. The spot where the bull of excommunication was burned is still pointed out. A statue of Luther under a Gothic canopy bears the inscription: *"Ist's Gottes Werk, so wird's bestehen; ist's Menschen Werk, wird's untergehen."* If it be God's work, it will endure; if it be man's work, it will perish.

Lutherans, a body of Christians, the members of which follow the teachings of Martin Luther. The name was adopted by the adherents of Luther to distinguish them from those of the other leaders of the Reformation. The Lutheran church is the mother of Protestanism. The Lutheran religion has for a long period of time been that of the state churches of Sweden, Norway and Denmark, and to a large extent of pre-war Germany, and Austria. There are also many Lutherans in Hungary and Finland.

The Augsburg Confession and Luther's Shorter Catechism contain the decisive principles common to the different bodies of Lutherans. But the foundation stone of the Lutheran church is Christ, for in Him, and His teachings, the Lutheran theology begins and ends.

There were several settlements of Lutherans in America in the early days. In 1619 a Lutheran pastor, Rasmus Jensen, a chaplain of a Danish expedition, preached for it while it was in winter quarters on Hudson Bay, 10 months before the Pilgrim Fathers landed at Plymouth Rock. This settlement was followed by Dutch Lutherans in 1623. In 1639, Reorus Torkillus, the first Lutheran minister to settle in the United States, arrived. He came at the instance of Gustavus Adolphus, who desired to spread the Gospel through colonization. He preached in Fort Christina. Germans settled in Pennsylvania in 1639, and Jacob Fabricius, a Hollander, preached to them in German in the Swedish block church erected in 1669.

The Lutheran church has reached large proportions since those days. It is now composed of three main bodies: the National Lutheran Council, the Evangelical Lutheran Synodical Conference of North America, and independent congregations. The National Lutheran Council comprises 9 Lutheran synods, or general bodies, which are united for certain definite purposes. Its activities are varied and in 1921 its efforts were largely concentrated upon the work of European relief and reconstruction. The Evangelical Synodical

Conference of North America is composed of 5 synods.

Statistics for the United States and Canada (1920), show that the Lutheran donomination had 15,068 churches, 9,853 ministers, 3,684,294 baptized members, 2,466,645 confirmed members, 9,371 Sunday Schools with 1,019,076 members, and total receipts of $33,770,710. It is estimated that the total number of members in America, enrolled and not enrolled, reaches 15,000,000. Services are held in 17 different languages in the United States. The Lutherans maintain a large number of institutions, of educational and philanthropic nature and the Lutheran young people have an organization, the Luther League, which has a large membership in the United States and Canada.

Lützen. See GUSTAVUS ADOLPHUS.

Luxembourg Palace, a historic building in Paris, noted for its art galleries, its Renaissance gardens, and its architecture. It was begun in 1616 for Maria de Medici, and was modeled upon her former home in Florence, the Pitti palace. The interior was altered late in the eighteenth century; in 1835-41 a part was added which nearly doubled the palace in size, and a huge semi-circular senate hall built in the court between the two sections. This magnificent auditorium was burned in 1859, but was rebuilt on the original plan. The fine museum of modern art, the best collection of the kind in the world, has been removed to another building near by, though it is still called the Museum of the Luxembourg. The paintings on the walls and ceilings of the rooms and galleries of the palace form an interesting exhibit in themselves. The gardens are the most beautiful in Paris.

Luxemburg, an independent grand duchy of Europe, bounded on the north and east by Germany, on the south by France and on the west by Belgium. Its greatest length is fifty-five miles, greatest width thirty-four miles and area 998 square miles. The population is approximately 236,000.

Luxemburg forms a part of the Ardennes plateau and the surface is rugged and mountainous; covered in many parts with heaths and marshes, although most of it is well forested. The surface naturally falls into two main divisions, the Osling or northern and the Gutland or southern. Most of the Osling division is a high and bleak plateau with an altitude exceeding 1,300 feet, and a cold, swampy clay soil. Agriculture is practiced only in the valleys and the crops are limited to oats, rye, potatoes and hay. The region is sparsely settled, most of the inhabitants being in the valleys.

The Gutland, so called because of its relative fertility, is a part of the Lorraine plateau. It has a lower elevation and a comparatively good soil. Wheat is grown in considerable quantities. Other successful crops include barley, peas, beans, beets and alfalfa. The valley of the Moselle is warm and contains extensive vineyards and orchards which occupy the greater part of the Moselle valley communes. The chief wine growing centers are Wormeldingen, Wellenstein and Remerschen; Grevenmarcher is the chief market. A few vineyards may also be found in other localities near the Moselle valley, the total amounting to one per cent of the entire cultivated area. The amount of other live stock is negligible.

Luxemburg possesses a small section of the Minette iron field of Lorraine amounting to fourteen square miles. In 1913 the unexhausted portion of this area was estimated to contain 270,000,000 metric tons of ore which is specially suitable for conversion into steel by the basic process. One-third of the population works in the mines and furnaces of the iron district. Other industrial establishments include foundries, potteries, sawmills, quarries, electrical factories, textile works and manufactories of food products.

The prevailing speech of the population is German, but French is the language of the educated classes and of business. The franc is the monetary unit. The duchy has excellent roads, ample railway facilities, and excellent telegraph and telephone service. The primary and secondary schools are of a high grade and education is compulsory.

Luxemburg was originally the county of Lutzelburg and grew up around a town of the same name, but later the name was changed to Luxemburg. The grand duchy formed a part of the Holy Roman Empire. In 1842 it joined the German customs union, and this movement was the beginning of Luxemburg's industrial development.

During the World War Luxemburg was held by the Germans, but there was no despoliation. The Grand Duchess, whose German sympathies were in conflict with those of her subjects, abdicated in 1919 in favor of her sister Charlotte Aldegonde. Later in the year a referendum was held to decide the political and economic future of the duchy. The treaty of Versailles acquitted Luxemburg of her obligations to Germany, and it was known that the Peace Conference would not permit the resumption of the old relations. Therefore, the people voted to form an economic union with France and to retain their constitution and the Grand Duchess Charlotte.

Luxemburg is a constitutional monarchy, the chief power being vested in a grand duke (or duchess). The legislative body consists of a chamber of deputies of fifty-three members elected for six years.

There is also an advisory council of state appointed by the monarch. The minister of state is the chief executive officer, and he is assisted by directors of finance, interior and justice, all appointed by the monarch. All laws must be approved by the monarch and most of them are introduced by him or at his suggestion. Luxemburg has no university, but there are classical and other schools.

Luzon. See PHILIPPINE ISLANDS.

Lyceum, lī-sē′ŭm, a public gymnasium outside the walls of ancient Athens. It was near the Ilissus, with many pleasant paths and covered passages where Aristotle walked and talked philosophy with his disciples. The term is given in France to schools preparatory to the university. In America it is used not infrequently to designate a debating society or an association for literary improvement.

Lycidas, lĭs′ĭ-das, an elegiac poem by John Milton, published in 1638. The poem was written in memory of Edward King, a friend of Milton who was drowned in crossing from England to Ireland in 1637. This friend was the most promising of Milton's college acquaintances. His death was mourned by many. His university friends proposed to publish a little volume of verses as a memorial and asked Milton to contribute. Lycidas was the result. Milton undertook the writing with reluctance, but produced a poem which is regarded by many critics as reaching the highest perfection of which English verse is capable. Lycidas is pastoral. There is a prologue and an epilogue. The main body of the poem represents a shepherd mourning for his friend. There are irregularities of meter, which seem to harmonize with the strong feeling displayed. The word, "Lycidas," is a name for a shepherd, and is used often by Theocritus and Virgil.

Lycopodium. See GROUND PINE.

Lycurgus, a Spartan lawgiver. It is not at all certain that he was a real personage. Tradition relates that Lycurgus flourished about 900 B. C. According to popular accounts he refused the crown for himself, traveled in distant countries to study government, returned to Sparta, established a reformed plan of government, bound his neighbors to observe his laws until he came back, and then set out on a journey to return no more. The measures and institutions which are attributed to Lycurgus, or at least to this age, are both social and political.

1. A redistribution of land. Just what is meant by this step is not clear. It rests on the authority of Plutarch.

2. An army composed of all able-bodied Spartans. This placed the control of the situation in the hands of the citizens of a single city, Sparta. It created a warrior or governing class.

3. A reservation to the Lacedaemons, who were the citizens of associated or, more properly, subject cities, of trade, agriculture, and the handicrafts. These city people had a limited sphere of local government but no voice in central affairs.

4. A class of serfs known as helots.

Menial work was performed by them. The helots comprised four-fifths of the population. They represented, no doubt, a conquered, enslaved people.

5. Two kings instead of one. This division of royal power between two kings was expected to act as a check on royalty and prevent the development of despotism.

6. A senate of thirty elders. These elders held office for life. They were heads of noble families. The senate outweighed the kings, who were in reality but the agents of the senate.

7. A popular assembly. Membership was open to all free Spartans. This assembly chose senators and decided such matters as were laid before it.

8. The senate had a veto power, "if the people decide anything crookedly to put it back."

9. Ephors or dictators. Five magistrates were elected by the assembly yearly. They presided over the assembly and acted as judges in important matters. There was no appeal from them. Even the king, over whom they held the power of life and death, could not appeal from their decisions.

The institutions of Lycurgus may have been entirely the work of conquering invaders who established themselves in the city of Sparta and imposed their institutions on a surrounding people and on a serf population dominated by these agricultural and trading inhabitants. Spartan society and government contained at once combined elements of despotism, feudalism, aristocracy, and democracy.

Lydgate, John (1370?-1451?), English poet. He studied in both Oxford and Cambridge. He produced many poems, one of which, *Troy Book,* contains a panegyric on Chaucer. *The Story of Thebes* and *The Dance of Death* are other titles. Lydgate was fond of calling himself a disciple of Chaucer.

Lyell, Sir Charles (1797-1875), a distinguished Scottish geologist. He was a native of Forfarshire. He was educated at Exeter College, Oxford, where he came under the influence of Dr. Buckland, the geologist. He studied for the bar, but was first heard of through a paper on the marls of his native county. In 1823, being a man of independent means, he went to Paris and made the acquaintance of Cuvier and Humboldt. He traveled extensively throughout western Europe, examining the geological formations. He visited North America four times, lecturing in Boston before the Lowell Institute and elsewhere. He wrote the *Antiquity of Man* to prove that the human race has existed on the earth for a long period of time. His reputation rests chiefly on *The Principles of Geology,* the nature of which is indicated by its subsidiary title, "An Attempt to Explain the Former Changes of the Earth's Surface by Reference to Causes Now in Operation." Lyell was one of the first and foremost men to teach that the present physical features of the earth are the results of causes now in existence, working through long periods of time. His theory is now generally accepted. It is opposed to the doctrine of sudden and violent changes. He resided chiefly in London, where he held educational and honorary positions.

Lymphatic System. See CIRCULATION.

Lynchburg, Va., an industrial city is picturestquely situated on the James River and in view of the Blue Rdige Hills and the Peaks of Otter. It is 147 miles west by south of Richmond and is served by three railroads. Power developed from the James River is transmitted to industrial establishments producing cotton goods, plows, flour, wagons, bark extract, hardware and shoes. The largest single industry in the city is the shoe industry. Lynchburg is a shipping center for much tobacco, coal, iron ore and granite. It contains the Randolph-Macon College, Virginia Christian College, the Virginia Theological Seminary and College for Colored People, fine public schools, the Jones Memorial Library and a Federal building. This city was a base of supplies for the Confederates during the Civil War. Population in 1920, 29,956.

Lynch Law, a term used in the United States to characterize justice administered without due process of law. The origin of the term is quite uncertain. It was applied at first to the orderly action of communities taking justice into their own hands. In the

early days of San Francisco, for instance, the settlers organized in an orderly manner and hanged a large number of desperadoes and gamblers who had terrorized the town. Such proceedings were called sessions of the court of "Judge Lynch." Latterly, however, lynching has come to mean the more or less disorderly whipping or execution of persons suspected of crime. The Ku Klux Klan of the South was accused of frequent lynchings. In 1902, deplorable as it may seem, there were 241 lynchings in the United States, 162 of the persons lynched being negroes.

Lynn, Mass., a port of entry and an important manufacturing city, is situated on Massachusetts Bay and on the Boston & Maine and Boston, Revere Beach & Lynn railroads., twelve miles northeast of Boston. Lynn is the greatest shoe manufacturing center in the world. The boot and shoe industry began here in 1750, and had soon attained a position of the world importance both as to the quantity and quality of its production. Other industries are the manufacture of shoe supplies, the making of fine leather and morocco, and the manufacture of electrical appliances, machinery, boxes, patent medicines and foundry and machine shop products.

The manufacturing section of the city lies upon low ground along the bay, but not close to it, as there is a beautiful beach running for about four miles along the bay. There is a park that has an area of 2,000 acres—Lynn Woods, and several other parks. The city has a modern educational system, two large hospitals, a public library and many handsome public buildings. In 1800 Lynn had a population of only 2,837; fifty years later this had increased to 68,513; and in 1920 it was 99,148.

See MASSACHUSETTS; BOOTS AND SHOES.

Lynx, a large, grayish, densely furred, fierce member of the cat family. Although called the Canada lynx it ranges throughout a large part of northern America. It is about thirty-nine inches in length and stands eighteen inches high. It has a broad, flat head with a fierce face and a bobbed tail, black at the tip. A long pencil of stiff black hairs rises from each ear. The feet are heavily furred, enabling the lynx to tread lightly over loose snow, as though it wore snow shoes. The chief food of the lynx consists of rabbits and partridges, although nothing that is flesh comes amiss. It is not aggressive, but is a dangerous antagonist when brought to bay or when defending its young. The lynx hunts less by scent than by virtue of its keen sight, giving rise to the expression "lynx-eyed." There are a number of Old World species. The American wildcat, known also as the bay lynx, is a very similar, reddish-gray animal, about thirty-five inches in length, with like habits. It is more generally distributed in the older settled parts of the country. See CAT.

Lyon, Mary (1797-1849), an American educator, the founder of Mount Holyoke College. She was born on a farm near Buckland, Massachusetts. Her father died when she was five years old, leaving the family in poor circumstances, so that she obtained her education only by her own efforts—spinning, teaching, "working out," doing anything to get an occasional term at the academies near Buckland. She became a wonderful teacher, inspiring every girl with whom she came in touch with a sense of the dignity of life. With another great teacher, Miss Z. P. Grant, she worked at Ipswich, Massachusetts, trying to establish a good school for girls. It did not succeed, but Mary Lyon turned her boundless energy to the founding of a school that should succeed permanently. She planned it to help girls of the middle classes, who, it seemed to her, led a peculiarly empty life, and who, many of them, had a craving after knowledge which they could not satisfy. She appealed to the people of the middle class for money and after three years' work, by the help of many self-sacrificing, hard-working people, she became the principal of Mount Holyoke Female Seminary at South Hadley, Massachusetts. Her school was conducted with the ideal before her of "plain living and high thinking." The eighty girls did most of the housework. The total cost to each for the school year was sixty dollars. Miss Lyon's salary was two hundred dollars a year and her board. The influence of

this school upon American education for women can hardly be estimated. It produced hundreds of devoted teachers, who spread its influence far and wide. It dignified the very life of women. During the twelve years of her service there the school was greatly enlarged and gained a wide reputation for its splendid moral and intellectual standards. Today the school lives as Mount Holyoke College; it still stands for the principles laid down by its founder, Mary Lyon.

Lyon, Nathaniel (1818-1861), an American soldier of the Civil War, who became prominent during the contest between the Unionists and Secessionists in Missouri. He was born in Ashford, Conn., and was a graduate of West Point Military Academy. He took part in all the battles of the southern campaign, and was made a captain in 1851. In 1861 he was placed in command of the United States arsenal in St. Louis, where he became active in preventing the withdrawal of Missouri from the Union.

During the absence of General Harney, he took command of the Department of the West, and captured a force of Secessionists at Camp Jackson, St. Louis, and was made brigadier general of volunteers. On June 17th, 1861, he defeated a Confederate force under General Marmaduke at Boonville, and on August 10 attacked a superior force of Confederates under General Price at Wilson's Creek, when he was killed while leading a charge. Lyon bequeathed his entire fortune to the United States government, to be used in the further prosecution of the war. *The Last Political Writings of Gen. Nathaniel Lyon* were published soon after his death.

Lyons, or **Lyon,** a city of France. It is situated on a tongue of land at the junction of the Saone and the Rhone, about 170 miles from the Mediterranean. Thirteen bridges span the Saone westward, and nine bridges connect Lyons with the east bank of the Rhone. A circle of forts surrounds the city, converting it into one of the strongest inland positions of France.

In size and importance Lyons is the third city of France, ranking next to Marseilles and Paris. It is the greatest center of silk manufacture in the world. Two hundred thousand persons are said to be engaged directly or indirectly in the manufacture of thread, ribbons, watered silks, poplins, velvets, satins, shawls, and other silk goods. The valley of the Rhone is particularly favorable to the growth of the mulberry tree and the rearing of silkworms. There are other industries, such as dye works, foundries, potteries, tanneries, and breweries. Hats, boots and shoes, jewelry, chemicals, and stained glass are manufactured. The city is in the direct line of communication between Italy, Switzerland, and France. The upper waters of the Rhone are united to the Rhine by canals. The city is therefore admirably situated to import breadstuffs and to export the agricultural and manufacturing productions of the region in which it is situated. Immense quantities of the best chestnuts in Europe are shipped from Lyons.

Parts of the city are dirty and irregular, but the chief portion is well laid out and imposing in appearance. The city hall is considered one of the finest in France. There are thirteen miles of quays, along which handsome residences, business blocks, warehouses, and railroad stations have been built.

Lyons has a long history. A Greek colony was founded here 560 B. C. The Romans planted a colony here in 43 B. C. Trajan, Adrian, and successive emperors built up the city. In 478 it became the capital of the kingdom of the Burgundians. It suffered severely from the Saracens, but was fostered by Charlemagne. After the death of Charles the Bold it was the capital of the kingdom of Provence, the home of the troubadours. The city has been the scene of much religious disturbance. The Romans massacred many thousand early Christians here. Two ecclesiatical councils were held here by the Western Church. The second, held in 1274, was attended by 500 bishops. The popes resided here for a short time. Lyons was a Huguenot center, and was punished severely in 1572. In 1793 the city held out against the French revolutionists, but was chastised unmercifully after a siege of seven weeks. It is said that the revolutionists huddled crowds together and mowed them down with grapeshot. Later, after the fall of Robespierre, the citizens laid hands on as many Terrorists

as they could find and drowned them in the Rhone. Four Roman emperors were born at Lyons. Ampère, Jussieu, and Jacquard, the inventor of the figure loom, were also natives. Population, 472,000.

Lyre, the most ancient of stringed musical instruments, belonging to the same class as the harp. According to Greek legend it was invented by Hermes, who made the first lyre by stretching four strings across the shell of a tortoise. It is believed that the instrument is of Egyptian origin. History tells us that the lyre was used at an early date by both Greeks and Egyptians, that it had from three to sixteen strings, and that it was made frequently with a whole tortoise shell for a sounding board. In the openings for the front legs a pair of goat's horns or imitation horns of wood were inserted, joined near their upper ends by a cross piece called a yoke. To this yoke were fastened the strings, which then crossed a bridge on the breast plate and were fastened at the lower end of the shell.

The lyre is seldom used now except by Greek shepherds and by certain African tribes. The instrument is represented frequently in art. The present meaning of the words *lyric* and *lyrical* is derived from the fact that among the Greeks the lyre was the favorite instrument for accompanying song and recitation.

Lyre-Bird, a perching bird of Australia. Like other animals of this region its makeup is contrary to all rules. It has the grasping feet of a perching bird, the body of a domestic hen, the appearance of a pheasant, and leads the life of a grouse. The male is remarkable for a showy tail somewhat like that of a peacock, the outside feathers of which curve inward, then outward at the tips like the frame of a lyre. It lives a shy life in the scrub. It nests on the ground.

Lyric, a poem, usually short, giving expression (in tuneful form) to the personal feeling of the poet. Technically speaking, the lyric is a poem that can be set to music; but, while all songs are lyrics, many of our most beautiful lyric poems do not possess that melodious arrangement of vowel and consonant sounds requisite if the lyrics are to be sung. Lyric poetry is distinctively the poetry of emotion. Dramatic poetry deals directly with action and character, as entirely outside of and apart from the poet. Epic poetry deals with a series of actions set forth by the poet, but still apart from his personal feeling. Such forms of poetry are objective. Lyric poetry is subjective. Through it, as a medium, the poet expresses the noblest thought and deepest feeling. We expect and find in lyric poetry rhythm, grace, and suggestive and beautiful imagery. Its aim is to awaken in the hearer the emotion felt by the poet. There are a great variety of lyrics. Hymns, songs, elegies, odes, and sonnets are the more important classes of lyrics; but many lyrics cannot be classified. It would seem that the variety can be limited only by the variety of the poet's moods and experiences. Burns, Shelley, Tennyson, Dobson, Swinburne, Longfellow, Lowell, and Poe may be mentioned as a few among the famous writers of lyric poetry.

Lysander, a Spartan naval and military commander, who lived in the fourth century. In 407 B. C., while in command of the Spartan fleet off the coast of Asia Minor, he defeated the Athenians under Antiochus, and thereby gained the esteem of both the Greeks and the Persians. His chief victories were those of Aegos-Potamus, which practically ended the Peloponnesian War; the capture of Athens and the bringing about of the succession of Agesilaus to the Spartan throne. In 395 B. C., Lysander was in command of an army against the Boeotians, and was killed in the battle of Haliartus. He was brave and courageous, but unscrupulous.

Lytton, Edward Robert Bulwer (1831-1891), first Earl of Lytton, an English diplomatist and poet. He was born in London, the only son of the novelist, Lord Lytton. He was educated at Harrow and Bonn, and entered the diplomatic service in 1849, holding posts in several European capitals. He was secretary of legation at Copenhagen, Athens, Lisbon and Madrid. He was made viceroy of India by Disraeli in 1876. He was well known as a poet under the name of Owen Meredith. His books include *Lucile, Clytemnestra and other Poems, The Ring of Amasis, Orval or the Fool of Time,* and *King Poppy.* In literature and in public life Lytton was a worthy son of a distinguished father.

M

Maartens, Maarten, märten märtenz (1858-1915), the pseudonym of J. M. W. van der Poorten Schwartz, a Dutch novelist, born in Amsterdam. He spent his early life in England. He was educated in Germany for the law, but preferred literature. His first book, *The Sin of Joost Avelingh,* was published in 1890. It was written in English, as are his other stories, although they present for the most part Dutch characters and scenes. *God's Fool* is regarded as Maartens' best novel. Others are *The Greater Glory, An Old Maid's Love, A Question of Taste,* and *My Lady Nobody.*

Mabie, Hamilton Wright (1845-1916), an American editor and author. Born at Cold Spring, New York. He was educated at Williams College and the Columbia Law School. For a time he practiced law in New York, but in 1884 became a member of the editorial staff of *The Christian Union.* Mr. Mabie wrote for peridodicals, and lectured on subjects connected with literature and education. Previous to his death he was editor of *The Outlook.* Among his works may be mentioned *Norse Stories Retold from the Eddas, Short Studies in Literature, Essays in Literary Interpretation, Nature and Culture, Books and Culture, Work and Culture,* and *Parables of Life.*

Mabinogion, măb-ĭ-nō′gĭ-ŏn, as used commonly, the medieval fairy tales and romances of the Welsh. The word Mabinogion is a plural form of mabinogi. The fact that *Mabinogi* means literally "boy's story" has given rise to the idea that any old Welsh story may be included under this general title. As a matter of fact, the word mabinog was used technically to designate a youth who was under the instruction of a regular bard, but had not yet acquired the art of writing verse, and mabinogion was doubtless the collection of incidents and tales upon which the mabinog's instruction was based,—his "stock in trade" John Rhys calls it. Until toward the middle of the nineteenth century these Welsh tales were unavailable, except to those who understood the Welsh language. Although a spoken language, Welsh was neglected by the learned unless themselves natives of Wales. Both Southey and Scott had urged that the Welsh stories be translated into English. This work was done by Lady Charlotte Guest, 1838-49. A later and more convenient edition was published in 1877. It contains twelve tales.

Mac, or **Mc,** a Gaelic prefix signifying son. Macaulay is equivalent to son-of-Aulay, or Aulayson, as the name would appear in a Teutonic language. The prefix is borne chiefly by natives of Scotland and Ireland and their descendants. In Scotland it indicates Highland ancestry. In Ireland a popular rhyme runs:

> By Mac and O you always know
> True Irishmen, they say:
> For if they lack both O and Mac,
> No Irishmen are they.

Macadam, a durable roadbed built of crushed rock. The bed of the proposed road is first of all graded and given a slight roll toward the sides. The road builder proceeds to apply several layers of metal, as the broken rock is called. The first consists of pieces four or five inches in diameter. Each successive layer is of smaller pieces. The road is finished with gravel and clay rolled or stamped into a smooth, compact roadway. The name is that of a celebrated Scottish engineer, John Loudon Macadam, 1756-1836. He spent several thousand pounds of his own money in demonstrating the value of this method of road building. Parliament voted him a gift of $50,000 in honor of his services. The macadam system of road building has spread all over Europe. No wayside sight is more common in Switzerland or along the Rhine than that of peasants on their knees, stone in one hand and hammer in the other, breaking metal to mend roads with. Stone crushers operated by power are now in use, especially in many American cities and in localities ambitious to have good roads. Granite is the most durable road metal.

McAdoo, William Gibbs (1863-), an American statesman and railroad official,

Secretary of the Treasury during a troubled period in the history of the United States. He was born near Marietta, Ga., and studied for about three years at the University of Tennessee. In 1885 he was admitted to the bar, practicing in Chattanooga until his removal to New York in 1892. In 1902 Mr. McAdoo organized the New York & New Jersey Railroad, now the Hudson & Manhattan Railroad, of which he was elected president and director. He completed and operated the Hudson River Tunnel system. In 1912 Mr. McAdoo was vice-chairman of the Democratic National Committee. President Wilson offered him the post of Secretary of the Treasury, and he severed his railroad connections and entered upon the duties of state. In this capacity he was active in organizing the Federal Reserve System and the Federal Farm Loan System. He handled with skill the problems of taxation, distribution of government funds, war-risk insurance, soldiers' and sailors' insurance, and many economic problems of trade and agriculture, besides raising war loans and financing the allies. In January 1918 he was appointed Director-General of Railroads; and until his resignation in November, 1918, Mr. McAdoo performed the duties of these two important offices. Following his resignation, Mr. McAdoo removed to California.

McAlester, Okla., the county seat of Pittsburg County, is 120 miles southeast of Oklahoma City, on the Chicago, Rock Island & Pacific and Missouri, Kansas & Texas railroads. The city is the commercial center of a prosperous agricultural and stock raising region, and is also in the center of Oklahoma's most productive coal fields. An abundance of cheap fuel is an aid to manufactories of brass beds, mattresses, macaroni, flour, cotton-seed, oil, brooms and foundry products. There are several cotton gins and a number of wholesaling establishments.

McAlester is the site of the state prison, and also has two parks, two hospitals and a Carnegie library. It has a number of fine churches and a $300,000 high school building. In 1920 the population was 12,095.

Macaroni, a preparation of wheat dough made in the form of strips and tubes. It is an invention of the Italians. The Italian bakers work in small shops. Wheat flour which must be free from bran is mixed with hot water to the consistency of paste. The finer the flour, the finer the macaroni. The paste is placed in a hollow cylinder, the bottom of which is provided with slits, straight or circular. The dough is forced through these slits by a contrivance like a cheese press. The strips are cut into the required lengths as fast as they appear. They are rolled into tubes and hardened by a partial baking. When the paste is forced through small round holes the product is called vermicelli, an Italian name meaning literally "little worms." The difference between the two products is one of size and shape. Both have attained popularity in America, becoming known through Italian restaurants. After it has been boiled and baked, macaroni is served usually with grated cheese. Vermicelli is used chiefly in soups. Numerous factories have been established in the wheat-growing states and provinces of America, but we still import large quantities of Italian manufacture. The varieties of soft wheat that contain a large proportion of gluten, the gum that is secured by chewing a mouthful of wheat, are the best suited for the purpose. Macaroni wheat is well adapted, it is claimed, to certain soils of the semi-arid West. Extraordinary large yields are reported. Naples, Italy, is the world's center of macaroni making. Naples imports $1,000,000 worth of American durum wheat yearly, and sends America $4,000,000 worth of macaroni in return. See GLUTEN.

In the modern American macaroni factory, suitable wheat is first ground into meal, originally called by the Italians *semolina* or *semola,* and this name is still used by macaroni manufacturers although little known outside of the industry. With the addition of hot water, this meal is then worked into a dough and kneaded in large qpantities by a special kneading machine. The dough then goes to the macaroni machine proper, which has a removable bottom, so that all the various sizes of macaroni, spaghetti, vermicelli, etc., can be

made by the same machine, simply by using bottoms containing holes of different sizes. If the products are to be hollow, the dough is squeezed through holes of the larger sizes, over a conical blade which makes the holes through the macaroni.

When the machine is filled with dough a cylinder fitting tightly into it squeezes the dough through the bottom holes to the size desired, the same kind of dough being used for all sizes. As it comes out of the macaroni machine, it is cut off into the lengths required and hung over rods, which are then carried to the drying room. Only genuine macaroni, rich in gluten, can be dried in this way. Any other kind will not bear its own weight when it is hung over the rods while the dough is still wet. Genuine macaroni can therefore be told by observing if there is a flattened mark in the inside bend of the long tubes, which will appear if it has been dried by hanging over rods. After drying the macaroni is packed in boxes for sale.

Spaghetti is somewhat larger than vermicelli, and is made either in thin solid sticks or in small hollow tubes. Both spaghetti and vermicelli are cut off in short bundles after coming from the squeezing machine, and laid on trays to dry. Another product of the macaroni factories, called paste, is made in the form of lozenges, disks, stars, etc., for use in soups. These are cut out of a thin sheet of macaroni dough specially prepared for the purpose, being stamped out like small cakes.

Macaroni when boiled swells up to twice its original size and becomes pasty. Uncooked macaroni can be kept a long time without deterioration. Its composition is as follows: Water, 10.3 per cent; protein, 13.4 per cent; fat, 0.9 per cent; carbohydrates, 74.1 per cent. Its food value is 665 calories to the pound.

The United States in 1922 imported 1,991,933 pound of macaroni, valued at $177,354.

MacArthur, Arthur (1845 - 1912), an American soldier, was born in Springfield, Mass. He entered the army during the Civil War as first lieutenant in the Twenty-fourth Wisconsin Infantry. He took part in the battles of Perryville, Stone River and Chattanooga, and in the campaign of Atlanta. He was made lieutenant-colonel of volunteers, and was mustered out in 1865. General McArthur's war record was such, especially for gallant conduct at the battle of Missionary Ridge, that the congressional medal of honor was bestowed on him. He entered the regular army as first lieutenant in 1866, and in 1889 became assistant adjutant general with the rank of major. Shortly after the beginning of the Spanish-American War he was appointed brigadier-general of volunteers, and major-general of volunteers in August of the same year. From 1898 to 1899 he was sent on special duty to Havana, Cuba. In the latter year he was sent to the Philippine Islands, and in 1900 succeeded General Otis as commander of the Division of the Philippines and military governor of the Islands. In the same year he became brigadier general in the regular army, and in 1901, major general. When General McArthur returned to the United States he was successively made commander of the departments of Colorado, the Lakes, the East, the Lakes, California, and the Pacific Division. He reached the age limits and was retired by operation of law June 2, 1909.

MacArthur, Robert Stuart (1841 - 1923), American clergyman and author, was born at Dalesville, Quebec, and studied at the University of Rochester and at the Rochester Theological Seminary, Rochester, New York. Dr. McArthur was ordained in the Baptist ministry in 1870, and in the same year was called to the Calvary Baptist Church of New York City. Here he served continuously for forty years, resigning in 1911 to become president of the Baptist World Alliance. Dr. McArthur went to Russia in 1912 and secured from the Russian government permission to establish a Baptist college in Petrograd (then St. Petersburg). For many years he was editorially connected with the *Christian Enquirer* and the *Baptist Review*. He is the author of *Old Testament Difficulties, The True Scala Anta, The Christian Reign, Celestial Lamp, In Excelsis, Old Book and Old Faith* and numerous other works.

McBride, Sir Richard (1870-1917), a Canadian lawyer and statesman who, as premier of British Columbia from 1903 to 1915, was largely responsible for the remarkable political and economic advances made in the province during those years. Sir Richard was born at New Westminster, B. C., and attended Dalhousie University, at Halifax. Called to the bar in his native province in 1892, he practiced at Victoria until 1898, when he was elected to the British Columbia legislature. In 1900, he was made minister of mines for the province, and was chosen leader of the Conservative opposition in 1902. He attained to the premiership the next year. In 1915 he resigned this post and retired from politics to become provincial commissioner to Great Britain with headquarters in London. But he was in poor health and died two years later, in 1917.

MacCauley, Sir James Buchan (1793-1859), a Canadian lawyer, was born at Niagara, Ont. After admission to the bar, he became executive councilor, and in 1829 a judge of the queen's bench court. In 1849 he was made chief justice of the newly created court of common pleas, which position he held until 1856. Later, for a short period, he was judge of the court of error and appeal. He was chairman for the commission for the consolidation of the statutes of Upper Canada, and it was chiefly through his efforts that this matter was brought to a successful completion. He was knighted in 1859.

Macaulay, ma-kaw'lĭ, **Thomas Babington** (1800-1859), a British essayist and historian. He was born at Rothley, Leicestershire, October 25, 1800. He died at Kensington, December 28, 1859. The Macaulays, as the name indicates, were Highlanders. Great Grandfather Aulay Macaulay and Grandfather John Macaulay were parish ministers with their full share of tribulations and blessed with very moderate circumstances, amid which they reared large families of from twelve to fourteen vigorous children. They were intelligent, reading men. From them Macaulay inherited his literary ability as well as his features. Mr. Carlyle, as we learn from a note in Trevelyan's *Life,* caught sight of Macaulay's face in unwonted repose as he was turning the pages of a book. "I noticed," said he, "the homely Norse features that you find everywhere in the western isles, and I thought to myself, 'Well, anyone can see that you are an honest, good sort of a fellow, made out of oatmeal.' "

Macaulay's father, Zachary, entered the employment of a mercantile firm in Glasgow, and was sent out to Jamaica as bookkeeper on an estate. He was so outraged by the view he had of negro slavery that he refused to stay any longer. He returned to London and became an active anti-slavery worker. His home was in Clapham, then a pleasant suburban district of London. Young Thomas was a child of unusual promise. He learned to read without knowing how he did it. From the earliest childhood he had a wonderful command of language. When but four years old he was visiting the house of a friend. A servant had the misfortune to spill some hot coffee on the lad's legs. His hostess was, of course, very much mortified, and pitied the little chap's sufferings. When after a few moments she asked him how he was feeling, "the little fellow looked up in her face and replied, 'Thank you, madam, the agony is abated.' " He disliked arithmetic but was fond of composition. At seven he wrote a history of the world in a "boyish scrawl." Fortunately it has been preserved. For a child of his age it shows a wonderful breadth of reading. He does not hesitate to condemn Cromwell, later his idol, as an "unjust and wicked man." At eight he had Scott's *Marmion* by heart.

At eighteen Macaulay was sent to Trinity College, Cambridge. He shunned mathematics, cared little for Latin, but took the greatest delight in literature and composition. He won a collegiate prize for an essay on the conduct and character of William III. On graduation he was given a fellowship, an honor which carried with it no duties, but a pension of $1,500 a year for three years. He studied law and was admitted to the bar. At his father's request he prosecuted an obnoxious editor for libel, but he did not follow up his profession seriously.

He took an early interest in politics, wrote articles for various newspapers, and made some speeches in favor of the abolition of slavery in the British colonies. In 1825 Jeffrey, then editor of the *Edinburgh Review,* a violent Whig Journal, wrote to a London friend asking him, "Can you not lay your hands on some clever young man who can write for us? The original supporters of the work are getting old, and are either too busy or too stupid; and here the young men are mostly Tories." At the friend's suggestion Macaulay contributed his famous essay on Milton to the *Review* for August, 1825. It reviewed the period of the Commonwealth, one of the most exciting political periods in the history of England. It was written from a Whig point of view, and delighted that party immensely. Jeffrey wrote, "Macaulay, the more I think, the less I can conceive, where you picked up that style."

The Whigs took up Macaulay, invited him to their social functions, and gave him a seat in Parliament. In Parliament he advocated the abolition of the rotten boroughs, one of which he represented, and to his father's great joy, he was largely instrumental in the passage of a bill abolishing slavery in the colonies of Great Britain. In 1834 he was appointed a member of the Supreme Council of India, a position carrying with it a salary of $50,000 per annum. He remained in India four years. He then reëntered Parliament as the representative of Edinburgh, but retired from politics finally in 1856 to give the remainder of his life to literary pursuits.

Macaulay's literary activity took the form of essays, poetry and history. His principal essays treat of Milton, Machiavelli, Hallam, Southey, Lord Byron, Bunyan's *Pilgrim's Progress,* Dr. Johnson, Lord Bacon, Gladstone, Lord Clive, Ranke's *History of the Popes,* Warren Hastings, Frederick the Great, and Addison. As an essayist, Macaulay is unsurpassed. He has no predecessor. He is imitated easily, but the imitator is almost certain to make himself ridiculous.

In 1842 Macaulay surprised his admirers with a volume of poetry called *The Lays of Ancient Rome.* The most celebrated, known under the title of *How Horatius Kept the Bridge,* is familiar to every schoolboy. In 1848 the first volume of his *Macaulay's History of England* appeared. Other volumes followed in rapid succession. His happy publishers, Messrs. Longmans, were soon able to send him a check for £20,000 ($100,000), a bit of paper which has become memorable in the history of authorship. In 1857 Queen Victoria was pleased to give him a seat in the House of Lords, with the title of Baron Macaulay of Rothley, the place of his birth. Macaulay was much pleased with the honor but took no active part in the proceedings of the Lords.

His health was beginning to decline. He foresaw that he should never be able to carry to completion his plan of a history. In the autumn of 1859 he fell asleep in an armchair in the midst of his books. A few days later he was buried in state in the Poet's Corner of Westminster Abbey. He lies at Addison's feet. Macaulay never married. His home was kept by a widowed sister.

Macaulay was an upright man; his life was free from vice. He worked intensely. He read widely. It is said that he had the faculty of taking in the contents of a page almost at a glance. He had the ability of gleaning a volume while seeming to turn the leaves but casually. He was really storing the contents in his mind. His knowledge was prodigious; his memory unfailing. His reputation as a poet is not high. His treatment of history is brilliant, but not philosophical. He was one-sided—partisan in his discussion of public men and measures; a pamphleteer rather than a sober historian. His final reputation will rest on his work as an essayist.

Macaw. See PARROT.

Macbeth, king of Scotland. He reigned from 1040-1057. His predecessor was Duncan, the grandson of the famous Malcolm. Macbeth was also a grandson of Malcolm, and, according to the laws of Scottish succession, his claim to the throne was equal if not better than that of Duncan. Macbeth's ambition led him to contest the throne with Duncan. Holinshed's *Chronicles,* on which Shakespeare depended for the historical basis of his great tragedy, state that Macbeth slew

Duncan at Bothgowan. He is said to have visited Rome seeking pardon for the slaying of his king. The sons of Duncan fled to Northumberland and later gathered their friends and invaded Scotland, defeating Macbeth at the battle of Dunsinane in 1054. Macbeth fell three years later near Aberdeen, and was succeeded by one of Duncan's sons.

Macbeth, one of the four great tragedies of Shakespeare. It was written about 1605, and was published first in the folio of 1623. Shakespeare obtained his materials from the Holinshed's *Chronicles.* James I (James VI of Scotland) came to the English throne in 1603. Naturally, Scottish subjects became popular on the English stage. As Banquo was supposed to be an ancestor of James, his character in Shakespeare's play was a compliment to the king. The story as told by Shakespeare is not historical, but is founded on the fact that Duncan, who came to the Scottish throne in 1034, was assassinated by Macbeth, who, according to the rule of Scotch succession, was entitled to the throne rather than Duncan. *Macbeth* is one of the most intensely dramatic of Shakespeare's plays. Macbeth and Lady Macbeth are two of his most real and striking characters. The banquet scene, where Banquo's ghost appears to Macbeth, and the sleep-walking scene, are among the most vivid and forceful presentations of the effects of remorse to be found in literature.

The style of this mighty drama is pitched in the same high, tragic key as the action. Throughout, we have an explosion, as of purpose into act, so also of thought into speech, both literally kindling with their own swiftness. No sooner thought than said, no sooner said than done, is the law of the piece. Therewithal thoughts and images come crowding and jostling each other in such quick succession as to prevent a full utterance; a second leaping upon the tongue before the first is fairly off. I should say the poet here specially endeavored how much of the meaning could be conveyed in how little of expression; with the least touching of the ear to send vibrations through all the chambers of the mind. . . . The whole drama, indeed, may be described as a tempest set to music."—Hudson.

Maccabees, the name commonly given to a family of Jewish heroes, though strictly it should apply only to one—Judas, son of Mattathias. The name *Maccabaeus* was not adopted by the members of family, who were properly called *Hasmoneans,* but has been applied to them by others. The first of the family to gain prominence was Mattathias, who opposed the plans of the Syrian king Antiochus Epiphanes to crush by violence the rites of the Jewish religion and substitute therefor the cult of the Greeks. Mattathias killed with his own hand the first Jew who approached the foreign altar in his little town of Modin, near Jerusalem. He, with his five sons and other followers then fled to the mountains and thereafter persisted in opposing the Syrians. He died in 166 B. C. and was succeeded as leader by his son, Judas. The followers of Judas conquered and annihilated many Syrian tribes, and tore down every pagan altar they could reach.

McCarthy, Justin (1830-1912), a British journalist and author. He was born in Cork, and was educated privately, beginning work as a reporter for the Cork *Examiner* at the age of sixteen. Later he was connected with the Liverpool *Northern Times,* and in 1860 became reporter for the London *Morning Star.* The following year he became foreign editor for the same paper and three years later editor in chief. He spent three years, 1868-71, in the United States traveling and lecturing. He was a member of the editorial staff of the New York *Independent* at this time, and a prized contributor to various magazines. On returning to London he accepted a position on the *Daily News.* For seventeen years M'Carthy was a member of the Irish Parliament. He has published many novels, among them, *Dear Lady Disdain, Con Amore, Maid of Athens* and *Donna Quixote.* His historical writings include *A History of the Four Georges and William IV, A History of Our Own Times, The Reign of Queen Anne, Life of Sir Robert Peel, The Story of Mr. Gladstone's Life, Modern England.* He has written his autobiography under the title of *Reminiscences.*

McClellan, George Brinton (1826-1885), an American soldier. He was born at Philadelphia December 3, 1826, and died at Orange, New Jersey, October 29, 1885. He received his education at the University of Pennsylvania, and was graduated also at West Point in 1846. He

served creditably under Scott in the Mexican War, and was promoted to a captaincy for gallantry at Chapultepec. He served as an instructor at West Point, directed the river and harbor survey of Texas, and located the western end of the Northern Pacific Railroad. In 1855 he was detailed to report on the war in the Crimea. Two years later he resigned his commission and accepted a position as vice-president and engineer of the Illinois Central Railroad.

At the outbreak of the Civil War McClellan was commissioned to organize the volunteers of Ohio, and had charge of the Union troops that occupied West Virginia and cleared the way for the organization of that region as a Union state. This accomplished, he was called to Washington and placed in command of the army of the Potomac, with a commission as major general. On the retirement of his old commander, General Scott, McClellan was placed in chief command of the Northern army and was instructed to prepare plans for the capture of Richmond. In March of 1862 he began the famous Peninsular Campaign. His plans seemed to be all right, and later information shows that he might have accomplished his purpose easily if he had had the determination to carry them out. He greatly overestimated the resources of his opponents and spent his energies in calling for reinforcements and more supplies. As a matter of fact, he advanced within a few hours' march of Richmond, then retired to the coast without result. McClellan was next placed in command of the defenses of Washington, and later again took command of the army of the Potomac and defeated Lee in the battle of Antietam. Here again he showed indecision, waiting for reinforcements instead of following up Lee's retiring army. President Lincoln ordered him to Trenton, New Jersey, relieving him from further active participation in the war. McClellan was considered one of the ablest engineers that West Point has produced. His ability to plan a campaign was unquestioned. He was a favorite with his soldiers and brother officers. He had talent and opportunity. Indecision at the critical moment—hesitation to proceed when the time came—prevented him from becoming one of the most renowned generals of modern times. He possessed qualities of public leadership that Grant never had.

In 1864 McClellan was made the Democratic nominee for president. The election was confined, of course, to the Northern States. Lincoln received 212 electoral votes; McClellan, 21. New Jersey, Kentucky, and Delaware gave majorities for McClellan. Subsequently he pursued the profession of civil engineering, having charge of the construction of docks at New York City. In 1877 he was elected governor of New Jersey. He discharged the duties of his office with dignity and efficiency. His influence was in favor of right measures. Among his writings are the first volume of *Pacific Railroad Surveys, The Army of Europe, A Manual of Bayonet Exercise, the Army of the Potomac,* and *McClellan's Own Story.*

A son of his has been sent to Congress by a New York City district, and has served as mayor of Greater New York.

McClernand, John Alexander (1812-1900), an American soldier. He was a native of Kentucky, but with his family removed to Illinois at an early age. In that state he was educated, and was admitted to the bar in 1832. In 1835 he became editor of the Shawneetown *Democrat.* He was sent to the state legislature in 1836, and from 1843 to 1851, and again in 1859 was a Democratic member of Congress from Illinois. In 1861 he was appointed brigadier-general of volunteers and raised the McClernand brigade. In 1862 he led the right of the line in the attack on Fort Donelson and was shortly promoted to the position of major-general of volunteers. He commanded a division at the battle of Shiloh, and in 1863 succeeded Gen. W. T. Sherman in command of the expedition against Vicksburg. He was soon after relieved of command by General Grant. In 1864 he resigned from the army and resumed the practice of law at Springfield, Illinois.

McCloskey, John (1810-1885), a Roman Catholic prelate, the first American cardinal. He was born at Brooklyn; his education was pursued at Mount Saint

Mary's College in Rome, and the Catholic centers of France. His first charge was St. Joseph's Church in New York, which he assumed in 1834. In 1841 he was made president of the new St. John's College, now in New York City, but returned to parish work shortly afterward. Made coadjutor to Bishop Hughes of New York in 1844, he was appointed successively Bishop of Albany in 1847, Archbishop of New York in 1864, and Cardinal in 1875. His career was marked by great administrative ability as well as profound scholarship. He built the cathedral at Albany, founded a theological seminary at Troy, and established many orphanages, hospitals, reformatories, and other like institutions. His work as archbishop of New York was particularly memorable.

McClure, Samuel Sidney (1857-), an American editor and publisher, founder of the first newspaper syndicate in the United States, and of the publishing house that bears his name. He was born at Frocess, County Antrim, Ireland, but removed to America with his parents while still a child. In 1878, Mr. McClure was graduated from Knox College. From that time until 1884 he edited the *Wheelman* in Boston. In 1884 he founded the McClure Syndicate, in New York. This was the first organization in the United States to buy manuscripts from authors and sell them for simultaneous publication in various papers.

In 1893, he began the publication of the *McClure Magazine,* and his wit, courage and brilliance as editor soon brought it to the front rank of American periodicals. Mr. McClure was at the head of the publishing firm of McClure, Phillips and Company from 1899 until the business was acquired by Doubleday, Page and Company. In 1915, the S. S. McClure Newspaper Corporation was formed, and Mr. McClure became editor of the New York *Mail,* purchased in this year. He was at the head of the Montessori Association for a time, and it was due largely to his efforts that Madame Montessori engaged in her American lecture tour in 1913-14. Mr. McClure was made a trustee of Knox College in 1894.

McCormack, John (1884-), a famous Irish operatic and concert tenor, was born at Athlone, Ireland. He was educated at Summer Hill College, County Sligo, Ireland, but received almost all his vocal training from Vincent O'Brien, choirmaster of Dublin Cathedral. For a few months Mr. McCormack studied at Milan, Italy. After joining the Dublin Cathedral choir, Mr. McCormack won a prize at a musical festival. Since that day success has attended him. He made his London debut at Covent Garden, singing with Mme. Tetrazinni in *Rigoletto.* Since then he has appeared in numerous operatic roles, but his greatest successes have been won on the concert platform by his faithful rendition of Irish songs.

McCormick, Cyrus Hall (1809-1884), an American inventor and manufacturer to whose genius must be credited much of the world's advance in agricultural methods. He was born at Walnut Grove, Va., and educated in the public school there. In 1845 he removed to Cincinnati, and to Chicago in 1847. In 1831 Mr. McCormick invented the reaping machine that was subsequently patented and greatly improved. At the French exposition in 1878 Mr. McCormick received his first grand prize for his reaping and self-binding machine. He was also made a corresponding member of the French Academy of Sciences, and an officer of the Legion of Honor, and won numerous medals and prizes. Mr. McCormick founded the McCormick Theological Seminary in Chicago, and endowed a chair in Washington and Lee University.

McCosh, James a noted college president. He was born in Ayrshire, Scotland, April 1, 1811, and died at Princeton, New Jersey, November 16,1894. He was educated at the University of Glasgow, and took part in the secession of the Free Church. He was a professor of logic and metaphysics in Belfast, Ireland, from 1852 until 1868. He attracted attention by his ability as a lecturer and as a writer of philosophical works. In the year last named he was invited to take the presidency of Princeton College, New Jersey, a position which he filled with ability for twenty years. See BONNER.

McCrea, ma-krā', **Jane** (1753-1777), a victim of American Indian warfare. She was born in New York. Her father was a Scotch Presbyterian clergyman. At his death she went to reside with a brother near Fort Edward, New York. She was engaged to be married to David Jones, an officer in Burgoyne's army. Accounts differ as to the manner of her death. According to one account, a party of Indians had been sent out by her lover to bring her to camp. According to another, she was endeavoring to escape from the vicinity and was captured by a band of prowling Indians. At all events she was killed and scalped. Her death created the greatest horror on both sides of the Atlantic and aroused a protest against the employment of Indians as allies in time of warfare. It also caused hundreds to join the American forces. Her grave is still shown in the little burying ground near the ruins of Fort Edward. See BURGOYNE.

McCrea, John David (1872-1918), a Canadian physician, soldier and poet, was born at Guelph, Ontario, and educated at the University of Toronto. After graduation he was made governor's fellow in pathology at McGill University and later became lecturer on pathology and medicine. Dr. McCrea rose rapidly in his profession, becoming successively assistant physician to the Royal Victoria Hospital and physician to the Alexandra Hospital. During the South African War Dr. McCrea served as a lieutenant of artillery, serving with distinction. When the World War opened he went overseas with the Canadian Field Artillery; with this unit he served in the field until after the second battle of Ypres, when he was given a medical post. Dr. McCrea was not killed in action, but died of pneumonia; but his now famous poem, *In Flander's Fields,* is spoken by the voice of those who did die in action. While acquiring a high reputation in medicine and as a military man, Dr. McCrea also wrote a few poems, all of which are replete with deep feeling originally expressed; but the one quoted below is the one above all his others that will live. It was written during the second battle of Ypres and first appeared in *Punch*:

In Flanders fields the poppies grow
Between the crosses, row on row,
That mark our place; and in the sky
The larks, still bravely singing fly,
Scarce heard amid the guns below.

We are the Dead. Short days ago
We lived, felt dawn, saw sunset glow,
Loved and were loved, and now we lie
In Flanders fields.

Take up our quarrel with the foe;
To you from failing hands we throw
The torch; be yours to hold it high.
If ye break faith with us who die
We shall not sleep, though poppies grow
In Flanders fields.

McCutcheon, George Barr (1866-), a popular American novelist, was born in Tippecanoe County, Ind., and was educated at Purdue University. Entering newspaper work as a reporter on the Lafayette, Ind., *Journal,* Mr. McCutcheon was made editor of the Lafayette *Courier* in 1893. He is a talented member of a talented family. The cartoonist John T. McCutcheon is his brother. Between 1901 and 1913 Mr. McCutcheon published about 20 books, almost all of which enjoyed a large sale. Most of his stories are of a very romantic nature. The list includes *Graustark, Brewster's Millions, Nedra, The Husbands of Edith, The Rose in the Ring, A Fool and his Money, The Purple Parasol, The Prince of Graustark, Mr. Bingle,* and numerous others.

McCutcheon, John Tinney (1870-), a well known American cartoonist, on the staff of the Chicago *Tribune* since 1903. He was born in Tippecanoe County, Ind., and was graduated from Purdue University in 1889. From 1889 to 1901 Mr. McCutcheon was with the Chicago *Record*; with the Chicago *Record-Herald* from 1901 to 1903; and joined the *Tribune* in the latter year. His first political cartoons were made in the campaign of 1896, and while his reputation in the field of political sketches is well established, some of his finest work is of a non-political nature. Mr. McCutcheon has traveled extensively. He joined the Boers in the interest of his paper during the Boer War. In 1909-10 he was on a big-game hunt in Africa and contributed articles and cartoons to the Chicago Sunday *Tribune.* He was at Vera

Cruz and other parts of Mexico in 1914, and with the Belgian and German armies in the same year. In 1915-16 he was in France, Saloniki and the Balkans, always serving his paper. Some of his cartoon series are *Bird Center Cartoons, T. R. in Cartoons, Congressman Pumphrey, the People's Friend* and *The Cartoons That Made Prince Henry Famous.*

Macdonald, Flora (1722 - 1790), Scottish supporter of Charles Edward, the young Pretender. After his defeat at Culloden, April, 1746, every effort was made by the British authorities to effect his capture. He took refuge with the Macdonalds. He was a man of small stature and genteel, attractive appearance. Flora dressed him in women's clothing and passed him off as her maidservant. She succeeded in this way in conveying him to the Isle of Skye. Here he was concealed for a time, and succeeded finally in escaping to France. She was but twenty-four years old at this time. Later she married a clansman, Allen Macdonald. In 1775 she removed with her husband to Fayetteville, North Carolina. Oddly enough, during the Revolutionary War the Macdonalds took the side of King George. Allen became a brigadier-general under Cornwallis. Their five sons held office. At the conclusion of the war the family found it advisable to return to Scotland. During her lifetime, Flora kept as one of her choicest household treasures a linen sheet on which Prince Charlie had slept. On her deathbed she directed that it should be used as her winding-sheet.

MacDonald, George (1824-1905), a Scottish man of letters. He was born at Huntly in Aberdeenshire, and was educated at the University of Aberdeen. He was educated for what we should, in this country, call the Congregational ministry, but he joined the English Church and took up literature as a profession. MacDonald is the author of a number of juvenile books and poems and works of a religious nature. His reputation rests, however, on the novels dealing with Scottish character and scenery. *Robert Falconer* is considered his strongest work. Other novels are *Annals of a Quiet Neighborhood, David Elginbrod, Malcolm, Alec Forbes, Marquis of Lossie, Salted with Fire, Sir Gibbie, Donal Grant,* and *Warlock of Glen Warlock.*

Macdonald, Sir John Alexander (1815-1891), a Canadian statesman. He was born at Glasgow, Scotland, January 11, 1815, and died in Ottawa, Ontario, June 6, 1891. His parents removed to Canada when he was a mere child. He was educated at Kingston and was admitted to the bar in 1836. Eight years later he was elected to the Canadian Parliament, and remained ever afterward in government service. When the new constitution of Canada was adopted in 1867 he was made a member of the first cabinet, and was influential in promoting the building of the Canadian Pacific Railway. In his political affiliations, he was strongly attached to Great Britain and the crown. His reputation is that of a man of ability and integrity.

Macdonald, John Sandfield (1812-72), a Canadian lawyer and statesman, was born at St. Raphael's, Glengarry, Ontario. He chose law as a profession, and was admitted to the bar in 1840, beginning practice at Cornwall. Entering politics, Macdonald was elected Conservative member of the Canadian Legislative Assembly, holding this position for ten years. His career showed him to be of marked political independence, although he was originally elected as a Conservative. From 1849 to 1851 he was Solicitor General for Upper Canada in the Liberal Lafontaine-Baldwin administration. Even here he showed his independence, for though acting with the Liberals, he differed from them on several important questions. In 1862-64 Macdonald became Premier in the Macdonald-Sicotte administration, which later became the Macdonald-Dorion administration through the retirement of Sicotte. Macdonald was not a supporter of the movement for the confederation, though he became its loyal supporter after 1867. He was the first premier of the province of of Ontario, from 1867 to 1871.

Macdonald, Sir William Christopher (1831-1917), a Canadian philanthropist, noted for his interest in McGill University, to which he gave generously, particularly to the work in chemistry. He was born at Glenaladaly, on Prince Edward

Island, his father being the president of the legislative council of the province. The boy's education was received at Central Academy, Charlottetown. He became a merchant, and a director of the bank of Montreal. For many years he has been governor of Montreal General Hospital and of McGill University.

MacDowell, Edward Alexander (1861-1908), an American composer, was born in New York City. His first teachers were Buitrago, Desvernine, and Teresa Carreño. Mme. Carreño later became one of his enthusiastic supporters, and hardly played a program without including one of MacDowell's compositions. MacDowell is so far America's greatest and most distinguished composer, his works showing marked genius and originality. Going abroad, MacDowell entered the Paris Conservatory, where he studied the piano under Marmontel and composition under Savard. However, not being quite satisfied with his progress, he went to Germany, where he had instruction from such great teachers as Louis Ehlert and Karl Heymann in piano, and Joachim Raff in composition. Here he met Franz Liszt, who made opportunity for MacDowell to present some of his compositions in concert. He returned to the United States in 1888, settling in Boston. His compositions for voice and piano are numerous, some of them exquisitely lovely, and in originality can only be compared with those of Claude Debussy. One of them, *To a Wild Rose,* for the piano, is a veritable gem. His works will have a permanent place in musical literature.

McDowell, Irvin (1818-1885), an American soldier noted for his services on the federal side in the Civil War. He was born at Columbus, Ohio, and studied in France and at West Point from which he graduated in 1838. He was an assistant instructor there for a time, served with distinction in the Mexican War. Soon after the outbreak of the Civil War he was made brigadier-general and given command of the Army of the Potomac. The disastrous defeat of the Federals at the battle of Bull Run turned public opinion against him and he was succeeded by McClellan. Later, as commander of the Army of the Rappahannock, he served with great bravery at Cedar Mountain and the second battle of Bull Run. He was then removed from the field. He asked for an investigation, and was fully acquitted of all charges brought against him.

McDowell, William Fraser (1858-), a bishop of the Methodist Episcopal Church, was born in Millersburg, Ohio and educated at Ohio Wesleyan University. He became the pastor of a church in 1882, the following year he was stationed at Oberlin, Ohio, and in 1885 removed to Tiffin, where he remained until 1890 when he became Chancellor of the University of Denver. He remained in this position until 1899 when he was elected corresponding secretary of the Board of Education of the Methodist Episcopal Church. In 1904, he was elected bishop; in 1917 he was the Lyman Beecher Lecturer at Yale university. He is author of *In the School of Christ, A Man's Religion,* and *Good Ministers of Jesus Christ.*

Macduff, măk-dŭff', **Earl of Fife,** a Scottish hero of the eleventh century. He was the principal agent in overthrowing Macbeth, the usurper; and in restoring Malcolm Canmore, son of Duncan, to the throne of Scotland. He was granted many privileges as a reward for his deed. Among them, a sanctuary or place of refuge was assigned him to which he and his successors might flee in case of committing unpremeditated murder. This sanctuary was a cross erected in the pass of Strathearn. The Cross Macduff, as it was called, stood for five hundred years, and the pedestal still remains. Shakespeare has introduced Macduff in his play of Macbeth. He is represented as of a rather mild disposition, but, aroused almost to madness by the slaughter of his wife and children, he meets Macbeth, fights with him, and kills him.

Mace. See NUTMEG.

Mace, originally a stout club used as a weapon, but now a club shaped staff used as a symbol of authority. In the latter sense it was used by the early Romans and perhaps by other peoples before the time of the Romans. The mace of the House of

Representatives of the United States is a device about three feet long consisting of a group of ivory rods bound together by a strap of silver and surmounted by a silver ball on which is the American eagle, with wings outspread. The mace is borne by the sergeant-at-arms, who, when the members of the house seem to have gotten beyond control of the Speaker, has only to lift the mace to restore order; disregard of the mace may be punished by rebuke or even expulsion.

Macedonia, măs-e-dō'nĭa, an ancient kingdom northwest of Greece proper. The people were of Grecian blood, but were not recognized as such at the Olympian games and other national festivities. About 346 B. C., Philip, king of Macedon, forced his way into Grecian affairs despite the patriotic protests of the orator, Demosthenes. His son, Alexander the Great, practically made ancient Greece a province of the Macedonian empire. Macedonia was later subdued by the Turks, but was liberated as a result of the Balkan and World Wars. It is inhabited largely by a mixed people, Greeks, Jews, Bulgarians, Servians, Wallachians, Albanians, and Turks. They differ in language, in customs, and in religion, but were practically united in the desire to throw off Turkish rule. In 1913 Macedonia was partitioned among Servia, Greece, and Bulgaria. The greater part went to Greece. That which went to Servia is not a part of Jugo Slavia.

McGee, Thomas D'Arcy (1825-1868), a Canadian statesman and author, was born at Carlingford, Ireland, but removed to Boston, Mass., when seventeen years old. Here he entered the field of journalism, securing a position with the Boston *Pilot.* His persistence and brilliance won him the position of editor-in-chief of that paper when he was only twenty. McGee returned to Ireland in 1845. He identified himself with the "Young Ireland" party and danger of arrest forced him back to America in 1848.

After this he had a varied career, first as editor of the New York *Nation,* then as editor of a Boston journal, next as founder and editor of *The New Era,* in Montreal, and finally as a statesman. McGee was a lover of his native land, and his love led him into some unreasonable revolutionary activities in his youth, even at the time he was writing verse and serving in various editorial capacities. He modified his views, later, to a large extent. He was elected to the Dominion House of Commons in 1867, serving until he was shot to death by one of his erstwhile Fenian supporters. In 1862 he was President of the Council, and was Minister of Agriculture in 1864. McGee was a fine orator, and it was just after the close of a brilliant speech in Parliament that he was murdered.

McGill University, an institution of learning in Montreal founded by James McGill who, in 1813, bequeathed to the Royal Institution for the Advancement of Learning about $50,000 and an estate consisting of a manor house and forty-seven acres of land, for the establishment of a university in the province of Quebec. Not until 1829, however, did the college actually open. It had a precarious existense till 1852 but benefactions by Lord Strathcona, Sir William McDonald and others increased its endowment to over $3,000,000, and the value of the grounds and buildings to over $2,000,000. The educational work is carried on in McGill College and the Royal Victoria College for Women at Montreal, and in affiliated colleges elsewhere. Arts, applied science, law, and medicine comprise the four faculties of the institution. There is a conservatory of music also, and a normal school. The supreme authority of the university is vested in the crown, and is exercised by the governor-general of Canada. The academic body by whom the institution is controlled consists of a board of governors, fifteen in number, the principal and forty-three fellows. The fifteen governors are members of the Royal Institution for the Advancement of Learning. The president of the Board of Governors is ex-officio the chancellor of the university. The principal, who is the head of the academic department, is ex-officio the vice-chancellor. The fellows are representatives from all the faculties and affiliated colleges.

This institution has come to have the

highest rank among the universities of Canada as well as of the western continent; and has had connected with it many distinguished educators.

McGillivray, Alexander (about 1740-1793), a noted Creek Indian chief who took a very active part against the Colonists during the Revolutionary War. He was the son of a Scotch trader and a half-breed Indian woman, and was educated at Charleston, S. C. Placed by his father with a Savannah mercantile firm, McGillivray later returned to the Creek country, now Alabama. Here he acquired wealth through trading with the Indians. His mother was of royal stock, and upon her her death he succeeded to the leadership of the Creeks. He would not accept the office, however, until formally called to it by a council, whereupon he assumed the title of "Emperor of the Creek Nation.' Because his estates in Georgia were confiscated, McGillivray with all his subjects joined the British forces and was one of the chief instigators of the border hostilities. In 1790 he visited New York and made a peace treaty with the United States on behalf of his tribe. He was prevailed upon to resign his commission as colonel in the Spanish service and accept a major general's commission in the service of the United States. McGillivray was kindly, brave and adroit, and continued to rule the Creeks until his death.

Machar, Agnes Maule (1856-1927), a Canadian author, born and educated at Kingston, Ontario. At an early age she began to contribute poems, sketches and short stories to Canadian, American and English periodicals, and soon won a large public. She sometimes wrote under the pen name "Fidelis." In 1887 she won a prize offered by a Toronto paper for the best poem on the occasion of the Queen's jubilee. Miss Machar's numerous works include *Stories of Old Kingston; Lost and Won; Roland Graeme, Knight;* a collection of poems entitled *Lays of the True North; Katie Johnson's Cross;* and *Stories of the British Empire.*

Machiavelli, mäk-e-ä-vĕl'lee, **Niccolo** (1469-1527), an Italian writer and statesman. He was a native of Florence. He was descended from a noble family that had become impoverished in the revolutionary changes of that city. He appears to have been well educated, especially in the Latin language, but little is known of his early life. He came on the public stage soon after the expulsion of the Medici family. He held an important position as secretary of a body of ten men chosen to direct the government of the city. He had opportunity to know all that was to be known of the petty rivalries of the Italian states. He was sent on a number of diplomatic missions to France, Germany, and the neighboring cities. He may be said to have lived for years in the network of hypocrisy and crime for which this period of Italian history is noted.

On the return of the Medici family to power, Machiavelli was dismissed from office. Later he was arrested for alleged conspiracy against the leader of the Medicis, and was put to the torture. During his after years, which were spent in a hamlet near the city, he engaged in literary pursuits. Among his works are *A History of Florence, The Art of War, Essays,* and a number of comedies. His chief work is *The Prince,* a systematic discourse on the methods by which a politician may cause his state to rise in the world. It is a work without a shred of common honesty or principle. He views the people as so much wax to be molded by statesmen to their own purposes. This work, rather than his actual service in the world of diplomacy, has led to the adoption of the term Machiavellian for all that is crooked and unprincipled in statecraft.

As a man, Machiavelli was subtle and learned. He had read widely, particularly in Roman history and literature. He had traveled extensively and was well informed. Although he had a wife and six children, he ignored commonplace morality. His attitude toward the world was keenly intellectual, but unsympathetic and cynical. His career and writings would not be worth mention, were it not that they have had a tremendous influence in teaching politicians how to do the wrong thing. It may be said truthfully that his writings have had a pernicious influence. It is worth the student's

while to read a few of the famous Italian's coldblooded sentences:

The end justifies the means.

It is safer to be feared than to be loved.

The prince must renounce good, or it will prove his ruin.

A prudent prince cannot and ought not to keep his word, except when he can do it without injury to himself.

Either make a man your friend or put it out of his power to be your enemy.

Under no circumstances should you help a rival power in any of his enterprises, for the prince who contributes to the advancement of another power runs the risk of ruining his own.

It is as useful to persevere in the path of rectitude, while one feels no inconvenience in doing so, as to know how to deviate from it when circumstances dictate such a course.

See RICHELIEU.

Machine, any device by means of which force is applied more advantageously. The simple mechanical devices coming under this head in physics include the lever, inclined plane, pulley, wheel and axle, screw, and wedge. The fundamental law of machines is that the product of the acting force and the distance through which it acts is equal to the product of the resisting force and its distance. This is only theoretically true, for friction reduces the latter product somewhat. So the work put into the machine is always greater than the work accomplished by it, which is contrary to the current opinion that there is a gain in work or energy. The gain is one of advantage only, as a greater intensity of force at the sacrifice of distance, or vice versa; or a change in direction; or the utilization of forces other than muscular.

The ratio of the work gotten from a machine to that put into it is called its efficiency. The efficiency of a perfect machine would be 100 per cent; if one-fourth of the work were lost by friction, the efficiency would be 75 per cent. The efficiency of a steam engine is very low, only about 20 per cent being theoretically possible while much less than that is usual.

Machine Gun, a gun designed to deliver a continuous stream of projectiles, by means of mechanism which performs, either wholly or partly, the operations of loading, extraction and firing. The mechanism may be variously constructed, but its purpose always is to secure rapid and destructive fire, such as is impossible with hand operation of a gun of similar caliber and range.

The machine gun may have a single barrel or a series of barrels arranged horizontally or about a central axis. The former name for a machine gun firing small-arm ammunition was *mitrailleuse,* this term having come into world-wide use during the Franco-Prussian war of 1870-71, when the French guns so called were used with varying success. This class of machine guns now usually bears the name of the inventor, as in the case of the Gatling gun, the Maxim gun, and the Lewis, Marlin, Vickers and Browning guns. Another class of machine guns, firing shot and shell, are called revolving cannon, or rapid-fire cannon. The Hotchkiss revolving cannon, invented in 1887 by B. B. Hotchkiss, an American then residing in France, was the first machine gun having a caliber larger than that of an army rifle. This gun at first fired one-pound shells, and was afterward made to fire six-pound explosive shells, but was developed a few years later as a rapid-fire, single-shot weapon. In the Spanish-American war of 1898 the Maxim-Nordenfeldt automatic one-pounder, then recently introduced, was used for the first time, being a development of Hiram Maxim's earlier automatic gun for firing rifle ammunition.

Machine guns may also be classified according to their operating power, in two classes; namely, (1) those which are operated by hand power or a force applied exteriorly; (2) those in which the force of the powder gases, acting directly upon a piston or through the recoil of the barrel, fire the charges and expel the empty cartridges or shells in a continuous stream. The Gatling, Hotchkiss revolving cannon, and Nordenfeldt guns are representative of the first class; the Colt (Browning's patent), Hotchkiss automatic rifle, Maxim-Nordenfeldt, Benet-Mercie machine rifle, Maxim automatic gun, and the Lewis machine guns are of the second class.

The modern application of mechanical principles to firearms and artillery may be said to date from the invention of the breech loading rifle and the revolver, but there were many earlier attempts to pro-

duce multiple-firing guns. The Chinese are said to have had such a gun, double-barreled and firing three shots in rapid succession from each barrel, as early as 1607. We hear of an English gun that would discharge seven times, "very serviceable and not a bauble," in 1662; but it was not until fixed ammunition, in metal-cased cartridges or shells, was developed during the American Civil War that the era of invention of machine guns began, following the introduction of magazine and repeating small arms.

Dr. R. J. Gatling, of Indianapolis, Ind., in 1861, invented the successful pioneer machine gun called by his name, and first used in the Civil War. As subsequently developed and still used, it has from five to ten barrels, with a lock for each barrel; the barrels are arranged in a cluster around a central axis, and both barrels and locks revolve together. The cartridges are fed from a feed-case into a hopper on top, and in the later models from a feed-magazine. With the 10-barrel gun a fire of about 1,000 shots a minute can be delivered. These guns have been made in calibers from 0.42 to 1 inch, and in general principle are typical of their successors in military service. They are mounted upon a tripod or a light gun-carriage, according to the service for which they are intended.

The Maxim gun, invented by Hiram Maxim, an American, was an ingenious and efficient weapon. It was a single-barreled machine gun in which the force of the recoil was utilized to load and prepare the next charge for firing, while a water chamber surrounding the machinery kept the parts cool. The Nordenfeldt machine gun was originally designed as a naval gun for defense against torpedo-boats. It was later made with 2, 3, 4, 5, 7, 10, or 12 barrels, and could fire either volleys or single barrels. In case a barrel became clogged, the supply of cartridges could be cut off from it and the firing continued from the other barrels.

The Hotchkiss revolving cannon, typical of its class of machine guns, combined the advantages of long range shell-firing with rapidity of action. It had five barrels arranged around a central axis, with a fixed breech containing the loading, firing and extracting mechanism. The rotation was intermittent, the loading, firing and extraction of the empty shell being performed while the barrels were at rest. This gun fired from 30 to 80 rounds of explosive shells per minute, thus delivering from 750 to 2,000 pieces of shell after explosion with sufficient force to kill. Many forms of this gun are still in use.

In the World War of 1914-18 it was demonstrated that machine guns were effective up to 1,500 or 2,000 yards, especially against massed troops, or troops in close order. When it became necessary to arm airplanes, great activity developed among inventors, and the Lewis air-cooled machine rifle, invented by a retired United States army officer, was largely used in the American and British aviation services. The Browning automatic rifle and the Browning machine gun, one for individual use and the other mounted on a tripod for use by machine gun companies, were also developed late in the war, and proved successful. The Germans had been more active than any other nation in manufacturing machine guns in the years just prior to the war, and much of their early success was due to their greatly superior equipment in this respect.

In 1914 the Vickers machine gun was adopted by the United States Army to replace the Benet-Mercie automatic machine rifle previously used. The Vickers gun carries 250 cartridges in its retainer, as compared with 30 in the Benet-Mercie, and in an official test fired 6,000 rounds without ceasing. It weighs 36 pounds, is water-cooled, and is conveniently assembled and taken apart. It fires rifle ammunition of 30 caliber and in service is mounted on a substantial tripod.

Machine-gun manufacture proceeded at a great rate in the United States during the war, and up to the end of 1918 the entire number of American machine guns produced was 227,000. The Browning automatic rifle and machine gun were put into quantity production in time to be used in large numbers in the final battles in France. In the 47 days of battle in which

American troops were engaged in the Meuse-Argonne territory, they captured 2,864 machine guns from the enemy, and some of the most heroic of the many valorous deeds credited to American soldiers were performed in connection with the capture of machine-gun "nests," in the face of great odds.

MacKay, John William (1831-1902), an Irish-American industrial magnate, was born in Dublin but emigrated to the United States while still a boy. He learned the shipbuilder's trade in New York, but after the California gold strike he removed to that state, and to Nevada in 1852. Here he secured a two-fifths share in the famous Bonzaza mine of the Comstock Lode. He, with five other men, worked this mine, which finally yielded gold and silver to the value of $100,000,000. With three of his partners he formed and became president of the Nevada Bank, and in 1882 he and James Gordon Bennett formed the Commercial Cable Company and the Postal Telegraph Company. This resulted in a stiff but successful fight with the old cable companies. The cable company laid two lines across the Atlantic. Mr. Mackay was noted during the later life as a public benefactor; the large Roman Catholic Orphan Asylum at Virginia City, Nevada, was one of his gifts.

McKeesport, Pa., a manufacturing city, is situated at the junction of the Monongahela and the Youghiogheny rivers, 14 miles southeast of Pittsburg, and in the center of the coal and natural gas fields of the state. Locally, it is known as the "Tube City," being the home of one of the largest tube works in the world—The National Tube Company, employing bebetween six and eight thousand men. Other important manufactures are tin plate, tool steel, projectiles, railroad torpedoes, bricks and glass. It contains a high school, several business colleges and a Carnegie library. The population was 46,781 in 1920.

Mackenzie, Sir Alexander (1775?-1820), a Canadian explorer and fur trader, was born at Inverness, Scotland, and emigrated to Canada in 1779. Entering the service of the Northwest Company in 1787, he set out from Fort Chippewyan two years later, and explored to the Arctic Ocean the great river that bears his name—the Mackenzie. The most remarkable part of this expedition was that from the time he left the fort until the time of his return only 102 days had elapsed. In 1792 he started westward again. After ascending the Peace River and crossing the Rockies, he followed the Fraser River for a time and then set out for the Pacific Coast. This he reached in 1793, and so far as is known this was the first time the coast was reached from the interior. After that he took seriously to fur trading, made a fortune and for some years headed a company that figured largely in the Canadian fur trade. In 1801 he published the *Voyagers,* an account of his travels, and was knighted in the same year. He died in Scotland.

Mackenzie, Alexander (1822-1892), a Canadian statesman and the first Liberal Premier of the Dominion was born at Dunkeld, Perthshire, Scotland. At the age of twenty he emigrated to Canada, settling at Kingston, Ontario. He became first a stonecutter and then a building contractor. Mr. Mackenzie went to Sarnia in 1847, and by this time had so far improved himself intellectually that he became editor of the Liberal journal known as the *Lambton Shield.* Mr. Mackenzie from this time forward took a very active interest in public affairs, and in 1861 was elected to the Canadian assembly. In this capacity, because of his skill in debate, wide knowledge and wit, he became highly influential.

He became one of the strongest advocates of confederation, and after declining a place in the coalition ministry of 1865 He was elected to the new Federal House of Commons in 1867. Before the abolition of dual representation in 1872, Mr. Mackenzie also sat in the Ontario assembly.

So strong had his position in the political world become that when Sir John Macdonald resigned the Premiership in 1873 Mr. Mackenzie was called upon to form a ministry. His administration was marked by many salutary changes in Dominion affairs, political and civil. The Australian ballot was introduced, the Dominion Supreme Court was created, a government

for the Northwest Territories was organized and the instructions of the Imperial Government to the Governor-General of Canada were so far changed that since then the Governor-General has had to accept the advice of the Dominion Cabinet. Following the Liberal defeat of 1878, Mr. Mackenzie led the Liberal opposition for two years and sat in the House of Commons until his death.

Mackenzie, Arthur Stanley (1865-), a Candian educator and physicist, was born at Pictou, Nova Scotia, and was educated at Dalhousie University, Halifax. From 1887 to 1889 Mr. Mackenzie held the post of instructor in mathematics at Dalhousie University; and after spending two years in advanced study at Johns Hopkins University and post graduate work in the Cavendish Laboratory, Cambridge, with J. J. Thompson, he taught physics at Bryn Mawr College, 1891-1905. From the latter year until 1910 he was professor of physics at Dalhousie University, succeeding to the presidency of that institution in 1911. He has contributed articles to many scientific journals and also translated and edited a collection of papers on *The Laws of Gravitation.*

Mackenzie, Sir Morell (1837-1892), a noted English physician. He was born in Essex, the son of a physician, and studied at London, Paris, and Budapest. Diseases of the throat were his specialty, and after holding important hospital positions in London, in 1887 he went to Germany to attend the Crown Prince, later Emperor Frederick III, for cancer of the throat. In spite of bitter disagreements with other German physicians, he stayed by the emperor until the latter's death in 1888. Queen Victoria made him a knight for his services at the German court. He is noted chiefly as an expert in the use of the laryngoscope, an instrument for examining the interior of the larynx.

Mackenzie, Sir William (1849-1923), a Canadian railroad builder and administrator, was born at Kirkfield, Ontario, and was educated in the public schools there. In young manhood he taught school for a time and later engaged in the lumber business. His first railroad venture began when he secured the contract for the Midland division of the Grand Trunk line. Later, he constructed a part of the Mountain division of the Canadian Pacific Railroad. In 1886 Sir William formed a partnership with Sir Donald Mann, and the two began the construction of many lines of railroads that have since been united under one administration and named the Canadian Northern Railroad. Sir William was elected to the presidency of the Canadian Northern, and became active in the direction of several other enterprises. He was largely responsible for the legislation that resulted, in 1913, in granting government financial aid to the Canadian Northern, now a part of the Canadian National system. He was knighted in 1911.

Mackenzie, William Lyon (1795-1861), a Canadian statesman and reformer and the leader of the Upper Canada Rebellion, 1837-38, was born at Dundee, Scotland. At the age of twenty-five he emigrated to Canada, settling first at York (Toronto) and later at Queenston. In the latter town Mr. Mackenzie opened a bookstore, and in 1824 he began the publication of the *Colonial Advocate,* in which he bitterly attacked the government, insisting on reforms. A remarkable thing about his appearing in the role of political reformer was the fact that he had had practically no formal schooling, but had gained his wide knowledge by his own efforts.

Mr. Mackenzie soon moved to York, the capital of Upper Canada, and again began to issue his paper. His attacks upon the government continued, and so strong was his influence that in 1838 he was elected to the Upper Canada legislature. At that time, the legislature of the United Provinces of Quebec and Ontario, although an elected assembly under a limited suffrage, had no control over the executive council appointed by the Governor. The demand for the responsibility of this council to the elected assembly constitutes the struggle for responsible government. Re-elected two years later, he was not permitted to take his seat because of an alleged libel on the ministry. He visited

the United States in 1829, and in 1832 went to England and successfully advocated certain reforms in the Canada government and the removal from office of some objectionable government officials. Previously, he had been four times reelected to the legislature but was not given his seat. In 1834 he was again in Canada and in this year he was elected first mayor of Toronto, as York had been renamed. Also in the same year he was again elected to the legislature, and this time was allowed to take his seat.

In 1836, however, Mr. Mackenzie lost his seat in the legislature through the defeat of the Reform party. In Lower Canada, meantime, the French, led by Louis Papineau (which see), were planning an insurrection against the government. Mr. Mackenzie visited Papineau; he returned to Upper Canada and openly advocated insurrection and the establishment of a republican form of government. The *Colonial Advocate* had not appeared since 1834 but Mr. Mackenzie started a new paper, the *Constitution,* in 1837. In this he renewed his attacks; but not satisfied with this, on November 25, 1837, he proclaimed the establishment of a provisional government and in a few days had gathered a band of between 700 and 800 men with a view to marching on the capital and erecting an independent government. The machinery of the proposed attack did not work smoothly, and while the rebels delayed, the Governor of Canada, Sir Francis Bond Head, prepared a defense. When they did advance, December 5, they were met by a body of Loyalists, who fired a volley and dispersed the attackers. The latter retired to Montgomery's Farm, near Toronto; the Loyalists attacked and the Reformers were severely beaten. Mr. Mackenzie escaped to the United States, and after gathering a little group of followers he set himself up on Navy Island, in the Niagara River. He so annoyed both governments that he was arrested by American officials for violating the neutrality laws, was convicted, and was imprisoned at Rochester, N. Y. for eighteen months. He was pardoned in 1840, and was later employed in the New York custom house and then on the New York *Tribune.* The Canadian government granted an amnesty to those who had participated in the rebellion, and Mr. Mackenzie returned to Toronto. Again from 1851 to 1858 he served in the Ontario legislature.

Mackenzie, a river of northwestern Canada. It lies north of the sixtieth parallel. The Peace, the Athabasca, and other sources collect the waters of north Saskatchewan, north Alberta, and northeastern British Columbia. Slave River drains Athabasca Lake into Great Slave Lake, and the Mackenzie carries the waters of Great Slave 1,000 miles northward into the Arctic Ocean. The river was named for Alexander Mackenzie, a native of Inverness, Scotland. Setting out from Montreal in the interest of the Northwest Fur Company, he explored the basin of this river as early as 1789. In 1792 he crossed the Rocky Mountains, and reached the Pacific coast. He was the first white man to reach the Pacific by this route. The river is the largest wholly in the Dominion. At the beginning of the century its basin had a white population of 5,216. The northern portion of the basin belongs to the frozen Arctic waste region. Forests of fir, spruce, and pine, coming under climatic influences similar to those of British Columbia, clothe the mountain spurs of the southwestern region. The central and southern portion has a diversified surface, and would be productive, were it not that the growing season is so short. It is believed that coal and other mineral wealth in large quantities await the miner. Petroleum was discovered in 1921.

The large lakes of the Mackenzie basin are a continuation of the Great Lake system. They lie in the same curve that passes through Lakes Ontario, Huron, Superior, Winnipeg, and Athabasca. Great Bear Lake, the most northerly, is situated on the Arctic Circle. It takes its name from the fact that it is directly under the constellation of Ursa Major, or the Great Bear. It lies at an elevation of 200 feet above the sea. Its waters are clear. It is well stored with fish. Its area is equal to about half that of Scotland. Great Slave Lake is an irregular widening of the Mac-

kenzie River. It is about 50 miles in width and 300 miles in length. Its waters are clear and afford excellent fishing grounds.

See CANADA.

Mackerel, one of the great food fishes, everywhere abundant in Atlantic waters. It belongs to the trout and salmon family. The common mackerel has a spindle-shaped body, bright blue above and silvery beneath, the back marked with thirty-five wavy stripes. An average mackerel is fourteen to sixteen inches long and weighs two pounds. It is a very handsome fish. Mackerel may be taken with hook and line if the bait be kept moving rapidly. A "mackerel breeze" is a gentle wind suitable for mackerel trolling. They are taken also by large seines wrought by two boats. In this way a school may be surrounded and hauled aboard. A third method—the one most frequently employed—is that of drift nets. These nets are often a mile in length and twenty feet wide. One end is made fast to a buoy and the other is attached to the fishing boat. The upper edge is held up by cork floats; the lower edge is weighted with sinkers. The net is made of woven twine with meshes just large enough to allow the mackerel to pass until the first pair of fins is through, but not large enough to permit the largest part of the body to go through. The mackerel, once part way through, is thus unable to go ahead or to retreat. Each morning the fisherman gets into a small boat and goes the length of his net lifting it to the surface as he goes, removing the mackerel, and returning the net to the water.

The mackerel is a true sea fish, traveling in immense schools, some of which it is estimated contain as high as 1,000,000, barrels. They live on small fishes, and such minute shellfish as float on the waves. In the summer season they move north, keeping in water, as has been observed, having a temperature of about 45 degrees F. They spawn in the open sea. The female produces from 200,000 to 300,000 eggs. Each egg contains a tiny drop of oil that causes it to float. The young fish grow rapidly, attaining a length of about five inches in a single summer. In winter the mackerel shoals move farther out to sea. The mackerel fishery is one of the most important of fishing industries. It is estimated that the Scandinavian nations take 1,500,000,000 pounds a year, the fishermen of northern Scotland, about 200,000,000 pounds; the fishermen of Nova Scotia and Newfoundland, 250,000,000 pounds; the fishermen of New England, 65,000,000 pounds. Other nations as the Dutch, French, and Germans make smaller catches. Gloucester, Massachusetts, is an important center of the mackerel industry. A very similar mackerel is beginning to attract attention on the Pacific coast. There are perhaps 3,000 people engaged in these fisheries. They take about 50,000,000 pounds a year.

See COD; HERRING.

Mackinac Island, a small island in Lake Huron near the northwestern extremity, is a part of Mackinac County, Michigan. It is three miles long and two wide, is rocky and wooded, and has become a favorite resort with tourists. The island is interesting as the site of one of the oldest white settlements in the interior of North America. Governor Frontenac of New France had a settlement made here in 1670; a mission was established by Father Marquette in 1671; and it became a military post with the erection of Fort Mackinac in 1712. The British took the fort in 1812 but restored it to the United States in 1815.

On the island is the town of Mackinac Island, a state park that covers about half the island, and other interesting spots. In the park is a heroic statue of Father Marquette and a small natural bridge called Arch Rock.

McKinley, William (1843-1901), the twenty-fourth president of the United States. He was born at Niles, Ohio, January 29, 1843, and died at Buffalo, New York, September 14, 1901. He completed a portion of a college course at Allegheny College, Meadville, Pennsylvania. He taught in the public schools and served as clerk in a postoffice. June 11, 1861, he enlisted as a private in a company of the twenty-third Ohio volunteers. He was present in several battles, including Antietam and South Mountain. He was promoted several times. When mustered out, he held

the rank of major and was an acting adjutant general. After the close of the war he studied law at Youngstown, Ohio, and in the law school of Albany, New York. In 1867 he opened a law office at Canton, Ohio. Three years later he was made county attorney and took a prominent part in state politics. He was elected to Congress in 1877 and served almost continuously until 1890. He had a reputation as an orator. In his congressional career he came into prominence as chairman of the ways and means committee, and was the author of the McKinley Tariff Bill. In 1892 he was elected governor of Ohio. In 1896 he was nominated by the Republicans for the presidency. He received 7,104,779 votes, a popular majority. The vote in the Electoral College stood 271 for McKinley and 176 for Bryan. The war with Spain, the liberation of Cuba, and the acquisition of the Philippines took place during his first administration. In 1900 he was re-elected by a greater popular vote, receiving 292 electoral votes and carrying 28 states.

September 5, 1901, he visited the Pan-American Exposition at Buffalo, New York, and delivered an address on the questions of the day. On the following day, while holding a reception in the Music Hall of the exposition, he was shot by an anarchist. He died September 14th. His assassination created the greatest indignation. It was as much as a man's life was worth to say anything in palliation of the assassin's detestable act. Services were held abroad in Westminster Abbey and St. Paul's Cathedral. Sympathetic telegrams were received from all parts of the world. McKinley's remains were conveyed to Canton, Ohio, where they now rest under a fitting monument. Though not ranking with the foremost Americans in point of commanding ability, William McKinley was a patriot and a man of integrity. He met with business reverses, but refused utterly to take advantage of bankruptcy laws. He was a model son and a model husband.

The popular indignation and wrath at his murder led temporarily to some ill-advised attempts to check anarchist doctrines by dangerous interference with the precious American principle of free speech.

See PRESIDENTS.

Mackintosh, a long, loose waterproof garment worn by both men and women. It takes its name from Charles Mackintosh, the English inventor of the cloth. Mackintosh cloth is prepared by spreading several layers of India rubber paste on the surface of a cotton or worsted fabric. Sometimes the coated surfaces of two fabrics are united by pressure, forming a double-faced cloth.

Maclaren, Ian. See WATSON, DR. JOHN.

Macleod, mak-lowd', **Norman** (1812-1872), a famous Scottish clergyman. His father and his grandfather before him bore the name and were also clergymen of the Church of Scotland. In 1843 a long contest over the appointment of ministers came to a head. The state exercised the right of appointing ministers much as postmasters are appointed in this country. The Scottish churches very generally desired to select their own ministers. The renowned Dr. Chalmers led a secession of half a thousand ministers, who rose and left their seats in the Scottish General Assembly. Dr. Norman Macleod, though in sympathy with the aim of the seceding party, stayed staunchly by the established church, and was the leading spirit in its reorganization. Dr. Chalmers had 430 clergymen and congregations without church buildings or incomes. Dr. Macleod had as many church buildings and incomes without clergymen or congregations. He took the right course; he appealed to the masses, not to the authorities, for support. The record of his work in Scotland is one of the most interesting in the annals of church history. He was called to the Barony Church of Glasgow, one of the most important in Scotland. In 1860 he founded a magazine known as *Good Words*. It was so liberal and interesting that it had a wide circulation and became one of the most influential periodicals in Great Britain. His sterling qualities, individuality, and stout stand for the old order of things made him a favorite with Queen Victoria. Her friendship was a source of great comfort in his work. At his death, he was laid at rest in the quiet burial churchyard of Camsie. All who knew him united in saying that he had done his work in the world well. See PRESBYTERIANS.

MacMahon, mäk mä-ōn′, **Marie Edmé Patrice Maurice de,** Duke of Magenta (1808-1893), a noted French soldier and statesman. He was born at Sully and died at Paris. He was the descendant of an Irish family that fled to France on the fall of the Stuarts. MacMahon's father rose to be a peer of France. MacMahon served in the Algerian War, and took part also in the siege of Sebastopol. He led the French division which stormed the Malakoff in 1855. During the war with Austria in 1859 he was made Duke of Magenta in recognition of gallant service on the battlefield of that name. During the Franco-Prussian War he shared the disasters which overtook the French forces. He was defeated by the Germans at Wörth and surrendered a large army at Sedan. The Germans held him prisoner for a time. In 1871 he was placed in command of the French troops in Paris and suppressed the Communistic uprising. From 1873 to 1879 he was president of the French Republic. His reputation is that of a man of bravery, integrity, and patriotism.

McMaster, John Bach (1852-), an American historian, emeritus professor of history of the University of Pennsylvania since 1920. He was born at Brooklyn, N. Y., and educated at the College of the City of New York. He became noted as a civil engineer and especially as a writer on engineering subjects, and in 1877 was appointed instructor of engineering at Princeton College, serving until 1883. In the latter year Mr. McMaster was made professor of American history of the University of Pennsylvania, serving continuously until 1920. His *History of the People of the United States,* now become a standard, appeared in part in 1883. The work, in eight volumes, was completed in 1913. Mr. McMaster is a member of the National Institute of Arts and Letters, and in 1905 was chosen president of the American Historical Association. Other well known works by Mr. McMaster are *A School History of the United States, Origin, Meaning, and Application of the Monroe Doctrine, Daniel Webster, Benjamin Franklin as a Man of Letters* and *The United States in the World War.*

McMaster, William (1811-1887) a Canadian banker and philanthropist, was born in Tyrone, Ireland, and was privately educated. He emigrated to Canada in 1833. He set up in business a few years later and succeeded. After about fifteen years he became one of the founders of the Canadian Bank of Commerce. Mr. McMaster entered the political field in 1862 as a member of the Ontario legislature, and in 1865 became a member of the council of public instruction. He was always philanthropically inclined, and his name still survives in McMaster University, Toronto, a co-educational institution of higher learning which he founded.

MacMonnies, Frederick (1863-), an American artist. He was born in Brooklyn, New York. His mother was of Puritan descent, a grandniece of Benjamin West, the painter. His father was a successful importer. At five young Frederick modeled figures in dough from the kitchen table. At seven he used white wax chewing gum to model a figure of George Washington. At ten he was aroused to enthusiasm by an elephant exhibited by Barnum's circus and modeled a figure of it in clay. At seventeen he was fortunate enough to enter the studio of Saint-Gaudens, then in New York City. After assisting this eminent sculptor for a time he went to Paris and entered the School of Fine Arts. Here MacMonnies took the highest prizes awarded foreigners, and in 1889 he opened a studio of his own in the Latin Quarter. In this year he exhibited a *Diana* in the Salon and received honorable mention. Among the works of note executed by MacMonnies are *Nathan Hale* for City Hall Park, New York; Soldiers' and Sailors' Monument at the Vanderbilt Avenue entrance to Prospect Park, Brooklyn; *Shakespeare* and *Sir Harry Vane,* Boston; bronze doors for the Congressional Library, Washington. Since 1900 MacMonnies has devoted himself chiefly to painting. His most noted canvas is *The Curé of Giverny,* Giverny being the name of the French village in which he resided for many years.

Macon, Ga., the county seat of Bibb County, is an important manufacturing city situated on the Ocmulgee River, 93 miles

southeast of Atlanta and almost in the exact geographical center of the state. It is served by the Southern, Central of Georgia, Macon, Dublin & Savannah, Georgia, Macon & Birmingham and Georgia Southern & Florida railroads. Four of these roads maintain shops here.

One of the principal stimulants to Macon's industrial life is the abundant hydro-electric power generated by the ninety-foot falls a few miles above the city. There are factories for the production of cotton-seed oil, cotton-seed meal and cake, cotton-seed compound, lumber bricks, soap, knit goods, flour, sash and doors, foundry and machine shop products and numerous other commodities. Macon is also a commercial center. Since cotton was first raised in Georgia this city has been a market for that product, and it has a valuable trade in lumber, farm and orchard products and granite.

Macon has a good public school system supplemented by two libraries. Other educational institutions are Mercer University, Mount De Sales Academy, State Academy for the Blind, Wesleyan Female College and Saint Stanislaus College. The city has a Federal building, a Y. M. C. A. and a handsome Union Passenger Station. In 1900 Macon had a population of only 23,272, but in twenty years this had increased to 52,995.

McPherson, James Birdseye (1828-1864), an American soldier, prominent as an officer of the federal army in the Civil War. He was born at Sandusky, Ohio. In 1853 he graduated from West Point at the head of his class, which numbered among its members Philip Sheridan, John Hood, and John Schofield. For a year he was assistant instructor in practical engineering at West Point, then served in various kinds of construction work until the Civil War broke out. In 1862 he became brigadier-general of volunteers, and was aide-de-camp to General Halleck at the siege of Corinth. At Vicksburg he played an important part, and on Grant's recommendation was made a brigadier-general in the regular army, with the command of the district of Vicksburg. In 1864 he served with Sherman, and was afterward made commander of the Army of the Tennessee, in that capacity aiding Sherman in his Georgia campaign. On July 22, 1864, while engaged in a skirmish near Atlanta, the gallant leader was killed. In a letter General Grant praised him as "one of the ablest engineers and most skillful generals." In his Memoirs he said, "In the death of McPherson the army lost one of its best generals."

Macready, mak-rē'dĭ, **William Charles** (1793-1873), a celebrated English actor. He received his early training in a theater at Birmingham of which his father was the manager. He appeared at Covent Garden Theater, London, in 1816. His early competitors were Kean, Young, and Kemble. He became the manager of the Covent Garden Theater, and in 1841 he took charge of Drury Lane Theater. He toured the large cities of Great Britain and appeared in France. He made several visits to America. While playing in the Astor Place Opera House, May 10, 1849, a riot was precipitated by the adherents of Edwin Forest, a rival American actor. The disturbance was quelled by the militia. Twenty-two persons were killed and many injured. Macready's favorite characters were Macbeth, King Lear, Iago, Virginius, and Richelieu. See FOREST.

Mad Anthony. See WAYNE, ANTHONY.

Madagascar, măd-a-găs'kar, the one large island of Africa. It is a possession of France. It lies in the Indian Ocean, about 230 miles from the southeast coast of the African mainland. It is about twice as large as Great Britain and Ireland and somewhat smaller than Texas. The coast has few bays; the shore is low and comparatively level. The interior rises into a rough region of rocks and moors, 3,000 to 5,000 feet above the sea. The lower region is well watered, fertile, and well wooded. While the high interior has a temperate climate, the coast regions are sultry, swampy, and malarial. The season from November to April is hot and rainy, especially on the eastern coast; with terrific hail storms, thunder storms, and hurricanes every year or two. No snow falls on the island. About 4,000 plants have been described, including species of palm, bamboo, tree fern, baobab, tamarind, orchis, and others, many of which are not found elsewhere. Many curious animals are

found in the woods and water, including the lemurs or long-tailed monkeys, the aye-aye, and bats and chameleons without number. The remains of a bird larger than the ostrich have been found. Its egg was over twelve inches long. There are over 125 birds not found elsewhere.

The inhabitants number about 3,500,000. The capital, Antananarivo, in the center of the island, has a population of 65,000; the chief port, Tamatave, 15,000. The total railway mileage in 1923 was about 430, and the total miles of telegraph lines 652. There are some 462 miles of telephone lines, also, and three government wireless stations. Tamatave is regularly visited by French steamers, and a large number of vessels of all nationalities enter and leave the port.

Cattle-breeding and agriculture are the chief occupations of the natives. Silk and cotton weaving is carried on, also the making of panama and straw hats. The preparation of sugar, rice, soap and tapioca and the canning of meat are undertaken by Europeans. The chief minerals are iron, copper, lead, silver, zinc, antimony, manganese, nickel, sulphur, graphite, lignite and coal. The principal imports are cotton, beverages, machinery, metals, cement, lime and clothing, and the chief exports are gold dust, cattle, tanning bark, rice, hides, raffia fibre and wax. The trade is principally with France.

The Christian population is estimated at 450,000 Protestants and 50,000 Roman Catholics. There are many missionary societies, but the outlying tribes are still mostly heathen. Education is compulsory, and there are many official as well as private schools. Antanànarìvo has a native medical school, an administrative and commercial school, a normal school and a school of agriculture. Madagascar is governed by a French governor-general.

Madder, a dye plant of the bed-straw family. It has a weak, four-angled stem with whorls of prickly leaves, and small, greenish flowers succeeded by black fruit. Madder is a native of the warmer parts of Europe and Asia, where it is still cultivated. Commercial madder comes from Holland, France, Italy, and Turkey. The plants are started from cuttings set in rows like beans, and are allowed to grow two seasons. The roots are lifted in the autumn with a fork. They are washed, dried carefully, and freed from the outer skin by beating. They are ground into a powder or are sent to market in bales. Madder dye gives the famous Turkey red admired in oriental countries. It is well known also to the Greeks. The historical red of the French and British military uniforms is a madder dye. By the skillful use of a mordant, madder colors of great variety are produced, ranging from pink, through red and yellow, to purple and brown. Madder is the most important vegetable dyestuff known in the arts. Of late aniline red obtained by the distillation of coal tar has supplanted natural madder in part. See also INDIGO; DYEING; ANILINE.

Madeira, ma-dē'ra, a group of islands situated in the Atlantic Ocean, west of Africa. The group is a district of the kingdom of Portugal. The name of the group is derived from that of the chief island. The word Madeira is Portuguese, signifying a wood or forest. Area, 314 square miles; population is about 170,000. The inhabitants are of Portuguese descent. The hot winds of the Sahara reach the islands occasionally; otherwise the climate is charmingly agreeable. The islands are celebrated as a health resort and for the production of Madeira wine and sugar.

After his second unsuccessful armed attempt to regain the Hungarian throne (1921), the ex-Emperor Charles of Austria, with the ex-Empress Zita, was formally dethroned and was taken, with his family, into exile on the island of Madeira. See AUSTRIA; CANARY ISLANDS; WINE.

Madero, Francisco, a Mexican revolutionist, leader of the recent rebellion against the harsh rule of Diaz. In June, 1911, Madero after a series of victories over the troops of the regular government, "entered into a sort of gentlemen's agreement" with Diaz, by the terms of which the old autocrat was to leave Mexico forever. Madero's party while in power gave promise of decided improvement in the conditions of the Mexican laboring classes, who were virtually slaves under the old or-

der. While of aristocratic family, he was progressive and had great sympathy for and a thorough knowledge of the conditions of his less fortunate countrymen. Instead of secluding his wife, according to Mexican custom, he took her about with him and treated her with every respect. He was a man of great culture and fine scholarship.

His policy, however, did not suit the controlling elements among the people. On February 11, 1913, the whole army under General Huerta joined a new revolt and Madero was arrested. On February 23, while on the way to prison, he was shot to death, "while attempting to escape," as reported by his captors.

Madison, James (1751-1836), a distinguished American statesman and the fourth President of the United States, was born at Port Conway, Virginia, the son of a land owner. He entered the College of New Jersey (now Princeton University) in 1769 and was graduated with honors in 1771. Later, he did a year of postgraduate work and studied law. A public career was the end he had in view, and when but twenty-three he was appointed to the Committee of Public Safety of his county, and two years later, 1776, he was a delegate to the Virginia Revolutionary Convention.

As a member of this body Madison was a valuable ally of Jefferson in his agitation for the toleration of every religious denomination. He was sent to the first legislature elected under the Constitution drafted by the Virginia Convention, and in 1777 he was appointed to the council of state under Patrick Henry. He was chosen as one of Virginia's delegates to the Continental Congress in 1780, and from this time forward he sustained a reputation already made for purity of ideals, caution blended with courage, and extreme acuteness.

In the Congress he vigorously urged that Spain permit free and unhampered navigation of the Mississippi River; he insisted that the states should not be permitted to issue more paper money; and fought for an extension of the powers of Congress. In 1784 he again took a seat in the Virginia legislature, serving until 1786, and was elected to the Continental Congress again in 1787. In the latter year Madison also went as Virginia's delegate to the Constitutional Convention at Philadelphia. To this Convention he rendered such distinguished service that he won the title of "The Father of the Constitution." Chief among these services, and fully exemplifying his sense of justice, was his "Virginia plan," which provided that representation in both branches of Congress should be based on the population. The defeat of the plan detracts not at all from the fineness of its author's intention.

In cooperation with Jay and Hamilton, Madison produced the eighty-five political essays known as *The Federalist*. It is supposed that twenty or thirty of these papers came from his pen. Madison took notes on debates in the Convention, and these have been of the highest value to the Supreme Court of the United States in interpreting the Constitution.

Upon his return to Virginia after the Convention, Madison was made delegate to the state convention called to ratify the new Constitution. He led the Federalists in this body, defeating his chief political enemy, Patrick Henry. He stood for election to the Senate but was defeated by the Anti-Federalists; the latter could not prevent his election to the House of Representatives, however. He served in this body until Washington's retirement, or eight years. In this capacity his energies found ample outlet. He proposed the resolutions creating the departments of State, War and the Treasury, proposed amendments to the Constitution which were later made the basis of the first ten amendments adopted, and took part in framing the first tariff act. From 1797 to 1801 Madison took but little active part in the affairs of the new Republic, but he made a definite contribution to political literature in framing the famous Virginia Resolutions, which were adopted by the Virginia legislature in 1798. (See KENTUCKY AND VIRGINIA RESOLUTIONS.)

Madison had been a powerful ally of Jefferson for a number of years, and when the latter succeeded to the Presidency of the United States, Madison was chosen Secretary of State. In the eight succeeding

years he directed the nation's foreign policy in a manner creditable to himself and to the country he represented, and in 1808 he was elected President, receiving 122 of the 175 electoral votes.

His regime opened with further discussions of the entanglements with Great Britain that had arisen while he was Secretary of State. In the end the United States submitted to England a request for the recall of the English minister. At the same time the country was involved with France over Napoleon's commercial decrees. The pro-war faction gained in power, and on June 18, 1812, the United States declared war on England. (See WAR OF 1812.)

Madison was at his worst as a war President. The American forces suffered several reverses on land, but they were highly successful on the sea. Madison was reelected in 1812, defeating De Witt Clinton. The longer the war continued the more unpopular the President became. Economic distress aggravated the discontent of the anti-war factions, and the Federalist party was forced out of existence. Some years passed before it was fully realized that while Madison did not want war, he was justified in the course he took.

The Republican party now adopted the old Federalist principle of a strong national government. The Republicans insisted on greater appropriations for the military and naval forces of the United States, and on the reestablishment of the national bank.

When Madison's term expired, his Secretary of State, James Monroe, was elected President. Madison retired to Montpelier, Va., his home, and devoted almost all of the remainder of his life to educational matters; he was particularly active in assisting in the development of the University of Virginia. His wife, Dorothea—familiarly known as "Dolly"—was the same charming hostess at Montpelier that she was at the White House, which has never been graced by a more popular woman.

Madison, Wis., the capital of the state and the county seat of Dane County, is situated in one of the most beautiful regions in the state, 82 miles west of Milwaukee and 130 miles northwest of Chicago. It is served by the Chicago, Milwaukee & St. Paul, Illinois Central and Chicago & Northwestern railroads.

DESCRIPTION. The city has an area of about six square miles. It lies between three lakes—Lake Monona, Lake Mendota and Lake Wingra—and near Lakes Kegonsa and Waubesa, and is 850 feet above sea level and 210 feet above the level of Lake Michigan. About these lakes and across the low surrounding hills a series of fine driveways has been constructed, and an area of about 500 acres has been set aside for parks. The finest of the parks are Tenney, Brittingham, Camp Randall Memorial and Vilas. The streets of Madison are regularly laid out, well paved and shaded.

Dominating all other buildings is the capitol. It stands on a hill and in the center of a public park, and is visible from almost every part of the city. Next in point of importance are the buildings of the University of Wisconsin. These are on the edge of Lake Mendota and occupy a tract of land having an approximate area of 600 acres. Other notable structures are the State Historical Society building, the State Asylum, State Fish Hatchery, Carnegie, Legislative Reference and State Law libraries, Sacred Heart Convent, United States weather bureau station, and numerous schools, churches and office buildings.

INDUSTRY AND COMMERCE. There are more than a hundred manufacturing establishments in Madison, producing agricultural machinery and implements, art glass, machine tools, electrical appliances, wagons, beet sugar, printed matter, gas engines and a host of other commodities. The city has large commercial interests and is an important shipping point. The surrounding territory produces tobacco, grain, flax, lead, zinc, iron ore and sand. The water works and electric light plant are owned by the city. Pop., 1920, 38,378.

HISTORY. This site was chosen for the state capitol in 1836, and the first house was built the following year. It was occupied by workmen who were engaged in the construction of the capitol, which was completed in 1839, and Madison has been the seat of government since that date. The

present capitol, completed in 1916, is one of the most beautiful buildings in the United States.

Madison Square Garden, a large amusement building in the heart of New York City. It contains an amphitheater which is used for amusements of various kinds, and for political and religious meetings. It will accommodate 15,000 people. The building contains also a theater, a ballroom, a restaurant, and a roof garden. It is built of buff brick and terra cotta, and is surmounted by a lofty tower, some 300 feet in height.

Madonna, an Italian word signifying my lady or madam. The Madonna and Child—Mary and the Christ Child—is the most celebrated subject in art. The painters of different nationalities and schools have vied with each other in depicting the Mother and Child. Strangely enough, the Hebrew woman and child are entirely wanting. Each artist seems to have aimed to produce the ideal mother and the ideal child of his own nationality. Italian, Spanish, French, German, Dutch, and Russian madonnas fill the museums of painting, but the dark Hebrew beauty and her black-eyed child are conspicuously wanting. The *Century Dictionary* names no less than forty-three madonnas worthy of mention, including masterpieces by Raphael, Murillo, Titian, Dürer, Holbein, and Leonardo da Vinci. Objects shown in the various paintings have given rise to special names, as Madonna of the Rabbit, the Madonna of the Chair, the Madonna of Pity, the Madonna of the Thistle Finch, the Madonna of the Canopy, the Madonna of the Rosary, the Madonna of the Rose, the Madonna of the Napkin, the Madonna of the Cherries, and the Madonna of the Grapes. Of all the madonnas, the most noted is the Sistine Madonna by Raphael, shown in the museum at Dresden. See RAPHAEL; HOLBEIN; MURILLO.

Madras, ma-drăs′, a city of British India. It is the capital of the province of that name. It was founded in 1639 by the English, who purchased a piece of ground for the erection of their first Indian trading post and a fort. Madras is the third city of India in commercial importance. The harbor is shallow and is exposed to the storms of the Bay of Bengal. Artificial breakwaters have remedied this difficulty to some extent. The city has grown rapidly. The government buildings make a fine show of solidity and prosperity. A university is maintained at government expense. The railroads of India take their time from the observatory. The productions of eastern Hindustan are marketed here. Teak, ebony, cotton, grain, indigo, coffee, tea, and dyestuffs are exported. The climate is exceedingly hot. The plantain, tamarind, mango, cocoanut, and other native fruits, as well as melons are abundant. In 1921 the population was 522,951.

Madrid, ma-drid′, the capital and largest city of Spain. It stands on a plateau of sandy hills, 2,450 feet above sea level, near the geographical center of the kingdom. It lies on a small stream, whose waters finally reach the Tagus. The place was taken from the Moors in 1083 and was for centuries a hunting seat of the Spanish monarchs. Charles V, deriving benefit from the keen air, made it an occasional place of residence. Philip II made it his capital in 1560. The city has over seventy public squares. The architecture of Madrid does not compare favorably with that of other European capitals, nor, indeed, do the public buildings equal those erected elsewhere by the Moors, whom the Spaniards drove out. The city has no cathedral. The royal palace is by all odds the most imposing building. It is 470 feet square and 100 feet in height. The material is a white granite, resembling marble. It was built, it is said, to rival the palace of Versailles. The armory near by contains the best known collection of military antiquities in Europe. The royal gallery contains many paintings by Titian, Raphael, Vandyke, Rubens, and other artists. It ranks among the half dozen great picture galleries of the world. A bull ring, dating from 1674, is situated near the east side of the city. It is large enough to accommodate 12,000 spectators. A university of 5,000 students is the leading educational institution. There are also schools of agriculture, architecture, engineering, and music. The national library contains half a million volumes. During the last twenty years Madrid has shown signs of an indus-

trial revival. Manufactures of tobacco, chocolate, leather, boots and shoes, plated ware, gloves and fans, carpets, and tapestry are prosperous. The city is the center of the railroad system of the country but has no natural advantages. It is remote from the sea and is situated in the midst of a waterless, barren region. During the winter, blasts from the Sierras on the north are piercing and keen. During the summer hot winds from the south parch the plateau, giving rise to a popular Spanish proverb that the climate consists of "three months of winter and nine of hell." "An ice house and a furnace" is the way a recent writer puts it. During the Napoleonic wars the French army occupied Madrid twice. It was also entered by the Duke of Wellington, who restored it to the Spaniards. Many of the edifices, statues, and decorations of the public squares suffered during the uprisings of the Carlists and Socialists during the period of anarchy following 1873. The population of the city in 1919 was 963,560. See SPAIN.

Maeceanes, mē-sē′-nas, **Caius** (73-8 B. C.), minister of the Roman Empire. Nothing is known of his early life. After the death of Julius Caesar he was the trusted friend and confidential adviser of Octavianus, known later as the Emperor Augustus. This emperor rewarded him with a palatial residence in the midst of gardens on the Esquiline. His home was the resort of the literary people of Rome. Virgil and Horace owed him many favors. A new poem or play was sure to be read in the house of Maecenas before it was made public. His name has become synonymous for a patron of literature. He himself wrote some minor works, a few fragments of which are extant.

Maelstrom, māl′strŭm, a famous whirlpool. It is situated off the Norwegian coast between two of the Lofoden Islands. The channel is about twenty fathoms deep. The tidal currents run from north to south for six hours, then for six hours in the opposite direction, creating a tremendous whirling of the water. The whirlpool is greatest at high tide or low tide. When the wind sets squarely against the current, the channel becomes furious. A ship cannot weather it. Whales have been dashed to their death on the rocks and thrown up on the shore. There is peril enough, but stories of ships engulfed and boats sucked down into the depths have been exaggerated to such an extent that the maelstrom has become a proverbial expression for certain sorts of danger.

Maeterlinck, mĕt′er-link, **Maurice** (1862-), a Belgian author and dramatist. He was born in Ghent and educated in a Jesuit school. Afterward he studied law. His interest, however, lay in literature, and when twenty-four years old he went to Paris seeking literary fame. Fame, and fortune too, was not long in coming, for the literary world at once recognized his genius. His first works were gloomy and dark—"they seemed the utterance of a troubled and profoundly melancholy soul struggling to find its way in the darkness." To this period belong among others, the dramas, *Princess Maleine, The Blind, The Intruder, The Seven Princesses, Pelleas and Melisande.* Then he married Georgette Leblanc, a Parisian actress and singer. She has been to him wisdom personified and has changed the whole current of his thought. His later writings are optimistic, full of courage, cheerfulness, and love of life. The most admired of these later books are the collections of essays, *The Treasure of the Humble, Wisdom and Destiny, The Double Garden,* and *The Buried Temple.* Well-known recent dramas are *The Blue Bird* and *Mary Magdalene.* The first-named play is a symbolic fairy story in which the Blue Bird represents happiness. Two wood-cutter's children, Tyltyl and Mytyl, have a dream, which is the play. The fairy Berylune enters their room and sends them out in search of the Blue Bird, or happiness. She gives Tyltyl a magic hat; on it is a great diamond, which, when he turns it, shows them the souls of bread, water, light, and all the common things. These take shape and dance out before them. The diamond also shows them the way into the Land of Memory, the Land of Night, and the Land of the Future, through all of which they must go to look for the Blue Bird. Bread, Sugar, the cat Tylette, the dog Tylo, and the other common things go with them. They have many strange adventures and catch

many birds that they think are blue, but they all turn to some other color in their hands. At last they return home, only to find what they had never noticed before, that their own bird is blue! While they are still rejoicing in the discovery, a neighbor asks them for the bird to give to her sick daughter. The children give it up, and the sick little girl is cured; but just as she comes running over with it to Mytyl, the bird flies out of the window. The neighbor child bursts into tears, but Mytyl says, "Never mind, don't cry, . . . I will catch him again." Then she steps to the front of the stage and speaks to the audience: "If any of you should find him, would you be so kind as to give him back to us? . . . We need him for our happiness later on." So ends the play. The lesson so beautifully presented is, of course, that happiness is to be found close at home, and in the common things of life. *Mary Magdalene* centers about the crucifixion of Christ, and sounds a deeper religious note than any of his former works. Maeterlinck lives and writes near Paris; he dislikes society and delights himself with his country home and his bees.

Mafia, mä-fē'ä, a secret society of Italy. It originated in Sicily toward the close of the nineteenth century. The members avenge their wrongs, real or fancied, with the stiletto. They are bound by oath not to carry any dispute into court and not to give evidence if summoned as witnesses. If anyone offend the Mafia, members are detailed by the officers of the organization to take the offender's life. Locally the society is noted for assassinations, and for an undue influence in the control of elections and other public matters. Owing to the large Italian emigration to the United States in the last quarter of the century, the Mafia has made its appearance in New Orleans, Chicago, New York, and other large cities. No Italian dare on his life give the police authorities information relative to the workings of the society.

In Sicily the Mafia rose to such a pitch that it became a national scandal. Extortion, blackmail, theft, arson, and the silent stiletto made life hardly endurable. The police shared the profits; the soldiers protected the police; the very judges on the bench protected the criminals and saw to it that none were convicted. Finally, King Victor Emmanuel took action. He sent some honest regiments from the Tyrol and the border of Switzerland to the scene. They swept the island. Unless a man could clear his skirts of suspicion he was shot. Over 5,000 members of the Mafia, and like enough some innocent persons, were executed on the spot. So far as organization goes, the Mafia was crushed. Many migrated to America.

So far as America is concerned, the worst outbreak occurred in New Orleans among the Italians engaged in loading and unloading ships. There were two rival organizations of stevedores. The stiletto societies began to get in their work. David Hennessy, chief of police, was stabbed in the back on the night of October 16, 1890. He had just passed a dark doorway in which the assassins were lurking. The citizens rose and lynched a lot of the worst characters they could lay hands on. What is left of the Mafia exists, it is believed, in local stiletto clubs without a widespread organization, and yet every now and then murders are committed thousands of miles apart that suggest the existence of some criminal directing central agency.

See SICILY.

Magazine. See PERIODICAL.

Magdeburg Hemispheres, a celebrated invention designed to show atmospheric pressure. About 1650 Otto von Guericke, burgomaster of Magdeburg, prepared two hollow hemispheres of copper. Their edges were ground and polished, so that when placed together, oiled, and twisted slightly, they formed an air-tight globe. One of the hemispheres was fitted with a stopcock through which the inventor exhausted the air by means of an air-pump. He exhibited his apparatus before scientific men of the day and before the emperor, Ferdinand III, at the Diet of Ratisbon. An old wood-cut shows von Guericke's demonstration and the astonished onlookers when sixteen horses could not separate hemispheres only twenty-four inches in diameter. The force with which such hemispheres are held together may be obtained readily. It is fifteen pounds for every square inch of the cross-section of the united hemispheres.

Magellan, Ferdinand (1480?-1521), a noted Portuguese navigator. He was of good family and spent his boyhood in the household of John II. He saw service in the East Indies and in Morocco. He took offense at a slight put upon him by King John. With a friend, an eminent astronomer and general, he repaired to the Spanish court with a proposition to open up a route to the Spice Islands of the East by sailing westward. King John, hearing of the proposition, now came forward with alluring offers, but Magellan had early completed arrangements with Charles of Spain. September 20, 1519, he set sail, going by way of South America. November 28, 1520, he passed between Tierra del Fuego and the mainland through the strait to which his name has since been given. April 27, 1521, he fell in conflict with the natives of one of the Philippine Islands. One of his ships, the Victoria, proceeded to the Spice Islands, and returned home by way of the beaten route around the Cape of Good Hope. It brought twenty-six tons of cloves. Although Magellan did not live to complete the circuit, he is spoken of usually as the first commander to circumnavigate the globe. His explorations resulted in the Spanish acquisition of the Ladrones and of the Philippine Islands. An account of the voyage, less complete than might be desired, was written by a volunteer member of his fleet. A monument in Magellan's honor has been erected in the city of Manila. See SPICE.

Magellan persuaded the Spanish government that the Spice Islands could be reached by sailing to the west, the Portuguese having previously reached them by sailing to the east, and, if this were accomplished, Spain would have as good a title to them, under the bull of Alexander VI, as Portugal. Five ships, carrying 237 men, were accordingly equipped, and on August 10, 1519, Magellan sailed from Seville. The *Trinitie* was the admiral's ship, but the *San Vittoria* was destined for immortality. He struck boldly for the southwest, not crossing the trough of the Atlantic as Columbus had done, but passing down the length of it, his aim being to find some cleft or passage in the American continent through which he might sail into the Great South Sea.

A voyage to the south is even more full of portents than one to the west. The accustomed heavens seem to sink away, and new stars are nightly approached. . . . For seventy days he was becalmed under the line. He then lost sight of the north star, but courageously held on toward the "pole antartike." He nearly foundered in a storm, "which did not abate till the three fires called St. Helen, St. Nicholas, and St. Clare appeared playing in the rigging of the ships." In a new land, to which he gave the name of Patagoni, he found giants "of good corporature" clad in skins; one of them, a very pleasant and tractable giant, was terrified at his own visage in a looking-glass. Among the sailors, alarmed at the distance they had come, mutiny broke out, requiring the most unflinching resolution in the commander for its suppression. In spite of his watchfulness, one ship deserted him and stole back to Spain. His perseverance and resolution were at last rewarded by the discovery of the strait named by him San Vittoria in affectionate honor of his ship, but which, with a worthy sentiment, other sailors soon changed to "the Strait of Magellan." On November 28, 1520, after a year and a quarter of struggling, he issued forth from its western portals and entered the Great South Sea, shedding tears of joy, as Pigafetti, an eye-witness, relates, when he recognized its infinite expense—tears of stern joy that it had pleased God to bring him at length where he might grapple with its unknown dangers. Admiring its illimitable but placid surface, and exulting in the meditation of its secret perils soon to be tried, he courteously imposed on it the name it is forever to bear, "the Pacific Ocean." While baffling for an entry into it, he observed with surprise that in the month of October the nights are only four hours long, and "considered, in this his navigation, that the pole antartike hath no notable star like the pole artike, but that there be two clouds of little stars somewhat dark in the middest, also a cross of fine clear stars, but that here the needle becomes so sluggish that it needs must be moved with a bit of loadstone before it will rightly point."

And now the great sailor, having burst through the barrier of the American continent, steered for the northwest, attempting to regain the equator. For three months and twenty days he sailed on the Pacific, and never saw inhabited land. He was compelled by famine to strip off the pieces of skin and leather wherewith his rigging was here and there bound, to soak them in the sea and then soften them with warm water, so as to make a wretched food; to eat the sweepings of the ship and other loathsome matter; to drink water gone putrid by keeping; and yet he resolutely held on his course, though his men were dying daily. As is quaintly observed, their gums grew over their teeth, and so they could not eat. He estimated that he sailed over this unfathomable sea not less than 12,000 miles.

His unparalleled resolution met its reward at last. Magellan reached a group of islands north of the equator—the Ladrones. In a few days more he became aware that his labors had been successful: he met with adventurers from Sumatra.

In the whole history of human undertakings there is nothing that exceeds, if indeed there is any thing that equals, this voyage of Magellan. That of Columbus dwindles away in comparison. It is a display of superhuman courage, superhuman perseverance—a display of resolution not to

be diverted from its purpose by any motive or any suffering, but inflexibly persisting to its end. Well might his despairing sailors come to the conclusion that they had entered on a trackless waste of waters, endless before them and hopeless in a return. "But, though the Church hath evermore from Holy Writ affirmed that the earth should be a wide-spread plain bordered by the waters, yet he comforted himself when he considered that in the eclipses of the moon the shadow cast of the earth is round; and as is the shadow, such, in like manner, is the substance." It was a stout heart—a heart of triple brass—which could thus, against such authority, extract unyielding faith from a shadow.—Draper, *Intellectual Development of Europe.*

Maggiore, one of the largest lakes of Italy, four-fifths of which is situated in Italy, and one-fifth in the Swiss canton of Ticino. Its length is 39 miles, its breadth from 0.5 to 5.5 miles, and it is 636 feet above sea-level, with a maximum depth of 1,158 feet. It is surrounded on the west and northwest by mountains, some of which are 7,000 feet high, and on the south and east by vine-clad hills. The river Ticino flows through its entire length, and in addition it is fed by 20 other streams. Along its shores are famous winter resorts where the Italian nobility congregate. Baveno, a town on the west shore, was a favorite resort of Queen Victoria. The Borromean Islands, famed for their picturesque beauty, are opposite Baveno. The chief city is Pallanza, with a population of 5,500.

Magi, The, mā′jī, a name given to the learned and priestly class of ancient Media and Persia. Originally, the Magi worshiped Ahriman, the god of evil, as well as Ormazd, the god of good. Zoroaster forbade devil worship, and the magi became priests of the reformed faith. They were teachers and philosophers as well as priests. The Wise Men from the East, who are described in the New Testament as guided by a star to the stable where the infant Jesus was born, were Magi. It is popularly supposed that there were three of these "Wise Men," although the number is not mentioned in the Biblical narrative. It was claimed during the Middle Ages that their bones were preserved in the Cologne Cathedral and they became celebrated as the "Three Kings of Cologne." Their names were said to be Gaspar, Melchior, and Baltasar. Gradually in Media and Persia, the Magi, from being the highest caste, degenerated to the rank of jugglers, fortune tellers, and quacks. The English word magic is derived from the word Magi.

Magic, măj′ĭk, a general name for a wonderful effect produced by a mysterious cause. We have the word from Persia, where the priestly caste, the wise men of the Medes and Persians, were called Magi. Magic is akin to enchantment, sorcery, witchcraft, alchemy, and other superstitions. Idolatry has its basis, not in veneration, but in a belief in magical power to do good and evil. A belief in magic is common to all primitive peoples. It dies hard. The African rain-doctor shook his medicine bag to bring up a shower. The magi pronounced mystical words to drive away the pestilence. Aladdin rubbed his magical lamp to make the genii appear. The fourteenth century quack rubbed healing salve on the edge of the instrument instead of on the wound, relying on magic. Nor is a belief in magic yet dead. The American Indian still dances to bring on a rain; the Mohammedan wears a sacred amulet; the would-be financier advocates making money with a printing press; and the invalid relies on patent medicines and incredible cures. All believe that, in some mysterious way, the desired result may be brought about. See IDOLATRY; SUPERSTITION.

Magic Lantern, an optical instrument used for projecting transparent pictures on a white screen or wall. It consists essentially of a dark lantern containing a lamp and fitted at one side with a tube, near the outer end of which a double convex lens is mounted. The picture or diagram is placed on a slide of transparent glass. The lens throws an enlarged, inverted image on the screen. In order that this image may appear upright, the slide is inverted. See PROJECTING MACHINES.

Magic Square, a series of consecutive numbers from one upward written in a square table so constructed that the sum of any row crosswise or up and down shall be the same as that of any other column. The numbers one to nine and one to sixteen may be written in magic squares whose constant sum is fifteen and thirty-four, respectively:

2	7	6
9	5	1
4	3	8

1	16	11	6
13	4	7	10
8	9	14	3
12	5	2	15

The difficulty of arrangement is increased by shifting the columns until the sums of the diagonal rows also come within rules. The numbers 1 to 25; 1 to 36; 1 to 49; 1 to 64, etc., may all be arranged in magic squares. The numbers 3, 5, 11, 13, 14, 16, 22, 24, 25, 27, 33, 35, 36, 38, 44, and 46 may be arranged in four-square columns whose constant sum is 98. The Arabians, to whose invention we owe advance in algebra and arithmetic, constructed these squares and appear to have worn them superstitiously as amulets or writings of magic power to ward off evil influences.

Magna Charta, măg'nă kär-ta, in English history, a famous document signed by King John June 15, 1215. King John having failed to live up to certain agreements with his barons, they took oath that "if the king delayed any longer to restore their laws and liberty, they would withdraw their allegiance and would make war upon him, until he should confirm the concession by a sealed charter." John tried to divide the barons by setting one against the other, and to separate the clergy from them; but the barons remained united. They met at Stamford and marched southward to London. John gave in, and met them in a meadow, called Runnymede, on the Thames near Windsor. Here he spent a day in discussing their demands, and finally yielded by signing the Magna Charta on the date stated. It was written in black letters in the Latin language. It contained forty-nine articles, afterward increased to sixty-three. It set forth the rights and privileges of each class of citizens and specified the powers which the king might assume.

Magna Charta corresponds in a rough way to our Constitution. It provided for the election of church dignitaries without the interference of the king. It pledged the sovereign not to levy aid without the consent of the common council of the kingdom. It limited fines to a reasonable amount. One of the most important clauses, known in history as the thirty-ninth article, declares that no free man shall be taken or imprisoned or outlawed or banished but by the lawful judgment of his peers or by the law of the land. This is the basis of the jury. Uniform weights and measures for the protection of merchants at home and abroad were provided for. As the Magna Charta was drawn up during feudal times and preceded the systematic method of collecting taxes that now prevails, no mention was made of taxation, but the claims a lord might make upon his vassal were gone over thoroughly with a view to preventing tyrannical exactions. Magna Charta is one of the world's great documents. It was confirmed repeatedly by succeeding sovereigns.

EXTRACTS FROM MAGNA CHARTA.

No scutage or aid shall be imposed in our kingdom, unless by the common council [parliament] of our kingdom, except to redeem our person, and to make our eldest son a knight, and once to marry our eldest daughter; and for this there shall only be paid a reasonable aid.

In like manner, it shall be concerning the aids of the city of London, and the city of London shall have all her ancient liberties and free customs, as well by land as by water.

Furthermore, we will and grant that all other cities, and boroughs, and towns, and ports shall have all their liberties and free customs, and shall have the common council of the kingdom concerning the assessments of their aids, except in the three cases aforesaid.

We will not, for the future, grant to any one that he may take the aid of his own free tenants, unless to redeem his body, and to make his eldest son a knight, and once to marry his eldest daughter, and for this there shall only be paid a reasonable aid.

Common pleas shall not follow our court, but be holden in some certain place. . . .

No constable or bailiff of ours shall take corn or other chattels of any man, unless he presently give him money for it.

No sheriffs or bailiffs of ours, or any others, shall take horses or carts of any man for carriage.

Neither we, nor our officers, or others, shall take any man's timber, for our castles or other uses, unless by the consent of the owner of the timber.

There shall be one measure of wine, and one of ale, through our whole realm, and one measure of corn, that is to say, the London quarter; and one breadth of dyed cloth; . . . and the weight shall be as the measures.

No bailiff, for the future, shall put any man to his law upon his single accusation, without credible witnesses produced to prove it.

No freeman shall be taken, or imprisoned, or

disseised, or outlawed, or banished, or any ways destroyed; nor will we pass upon him, or commit him to prison, unless by the legal judgment of his peers, or by the law of the land. [*Habeas corpus.*]

We will sell or deny, or defer, right or justice to no man.

All merchants shall have secure conduct to go out of England and to come into England, and to stay and abide there, and to pass as well by land as by water, to buy and sell, by the ancient and allowed customs, without any evil toils, except in time of war. . . .

Magnesium, one of the metallic elements. In chemical behavior it resembles calcium. Its compound with oxygen was long mistaken for lime. Davy separated magnesium in 1808 by electrolysis. It has the color of silver. It has a specific density of 1.75, being considerably lighter than aluminium. It melts at about the same temperature as zinc and tarnishes in air a little more readily than that metal. It may be hammered into thin sheets and drawn into wire, but it has little strength. Pure magnesium is sold for use in chemical laboratories in the form of a ribbon. It may be kindled in a candle flame like a pine shaving, and will continue to burn, giving out an intense light. A wire .012 of an inch in diameter will give a light equivalent to that of seventy-four standard candles.

Magnesium enters into the composition of certain medical remedies. One of its compounds is well known as Epsom salts. The metal enters largely into the composition of many rocks and minerals, notably magnesian-limestone, meerschaum, talc, serpentine, and hornblende. Despite the inflammable nature of magnesium, it is one of the elements entering into the composition of asbestos, a well known fireproof substitute for cloth, paper, and pasteboard. The oxide, known usually as magnesia, is a white powder without taste or odor. Mixed with water into a paste it sets like plaster of paris. Magnesia is hardly soluble in water but it absorbs moisture slowly. Its great merit in the arts is a high degree of infusibility. Heated in the flame of the blowpipe it gives out a white light much like a limelight. Mixed with clay it is used in the manufacture of crucibles and firebrick. The name of the element is derived from magnesia, found originally, it is reputed, in the province of Magnesia, Thessaly. Magnesium chloride is added to sizing of cotton cloth to prevent mildew.

Magnesium is one of the elements essential to plant life. Unless a seed has a proper amount of magnesium in its make-up it will not sprout. In a form called magnesite, a compound with carbon, magnesium is used in large quantities to "digest" or loosen the fiber of wood pulp. The commercial article is produced chiefly in Greece and Austria. California contributes a few thousand tons yearly.

Magnetism, the peculiar property possessed by some substances, more especially iron and steel, whereby under certain circumstances, they naturally attract or repel one another, according to definite laws. The substances which possess this property, or in which a similar condition can be induced, are called magnetic substances, and include, besides iron and steel, cobalt, nickel, magnetite, liquid oxygen, and certain alloys of unmagnetic metals, including copper, manganese and aluminum.

The lodestone, a variety of the mineral magnetite, or the native magnetic oxide of iron, is the best known natural magnet, and possesses the quality called polarity; that is, it has two opposite poles, positive and negative, one of which attracts and the other repels. Magnetite is commonly found massive in beds in the older crystalline rocks; and in the form of scattered crystals it is a frequent constituent of many igneous rocks. It is an important ore of iron and occurs in large quantities in Norway and Sweden, in the Adirondack and West Point regions of New York, and in New Jersey, Pennsylvania, Virginia and North Carolina.

Artificial magnets are familiarly known, for the most part, as straight or bent bars of iron or tempered steel which have been magnetized by the action of other magnets or of the electric current. But in modern industry artificial magnets of large size and great power are employed, for lifting and other purposes; these usually consist of a circular mass of soft iron, magnetized by electricity, and are known as electro-magnets. The older forms were known as bar magnets or horseshoe magnets. These are

also sometimes made of large size and considerable attractive power, while others are mere toys.

When a bar magnet is dipped into iron filings, it is found that they adhere most strongly at the extremities of the bar, which are called the poles of the magnet; but the filings do not adhere at all along the line midway of the bar, between these poles. Strictly speaking, however, except in the case of a long thin magnet, the poles are not exactly at the ends. The middle line is called the neutral line, or equator of the magnet; the straight line joining the poles is the axis of the magnet, or the magnetic axis.

A magnet, then, has two poles or centers of magnetic force, each having an equal power of attracting iron. This is the only property, however, which they possess in common; for when the poles of one magnet are made to act on those of another a striking dissimilarity is observed. If a magnet, or a magnetic needle, is suspended at its center of gravity, so as to be entirely free to turn, it takes up a fixed position, one end keeping north, or nearly north, and the other south. The north pole cannot be made to stand as a south pole, and vice versa; for when the magnet is disturbed, both poles return to their original positions. The pole which is directed toward the north, is called the north, north-seeking, or positive pole; that toward the south, the south, south-seeking, or negative pole.

When a magnet is thus suspended, the effect of another magnet upon it is also striking. The pole of the suspended magnet that is attracted by one of the poles of the second magnet is repelled by the other, and vice versa. Like poles of two magnets repel, and unlike poles attract each other.

If a magnet is divided at its center, each half is found to be a complete magnet with a north and a south pole; and this is found to be the case no matter how often the magnet is divided. We can therefore never have one kind of magnetism without having it associated in the same magnet with the same amount of the opposite magnetism; and it is this double manifestation of magnetic force which constitutes the polarity of the magnet.

The fact of the freely suspended magnet like a compass needle taking up a fixed position north and south, has led to the theory that the earth itself is a huge magnet, having its north and south magnetic poles in the neighborhood of the poles of its axis of rotation, and that the magnetic needle turns to them as it does to the poles of a neighboring magnet. All the manifestations of terrestrial magnetism tend to confirm this theory. The slight dip downward observed in the needle of a ship's compass is believed to be due to the earth's magnetism, and an iron ship or iron columns in a building may also be slightly magnetized by Mother Earth in the course of construction. See COMPASS.

Artificial magnets may be made by contact with other magnets, by magnetic induction without artificial contact, or by passing a current of electricity through a wire wound about the bar to be magnetized. By the latter means horseshoe magnets of great strength may be made, and the same principle is used in large electric lift magnets. The latter retain their magnetism only so long as the current is passing. Thus large quantities of scrap iron or steel may be lifted without the aid of slings, cables or chains by such a magnet, suspended by a crane or derrick, transported to another spot, and dropped wherever desired by cutting off the flow of electric current.

The electromagnet lift, as used in iron and steel works, railroad shops, shipyards, and other industrial plants, consists essentially of a steel shell, coil, bottom plate, terminal box and controller. The shell is a circular steel casting, which contains the coil of insulated wire and is designed to form a magnet somewhat similar to the ordinary horseshoe type, its outside rim and a central lug forming the poles. The bottom plate closes the under side of the magnet, and is made of tough non-magnetic steel plate, to serve as a protection for the coil and resist hard wear in service. The terminal box, bolted to the top of the shell, is a steel casting and contains the sockets in which the coil wires terminate, and by which the conductor wires from the generator are connected with the magnet. A special controller, with a set of resistance coils

to take up the "back kick" that results from turning the current on and off frequently in operating the lift magnet, completes the mechanism. Loads of iron or steel scrap, pieces of machinery, etc., weighing as much as twenty tons, may be lifted and transported to a considerable distance in shops and yards by such an electromagnet, operated in connection with a traveling crane. See COMPASS.

Magnetite. See IRON.

Magneto Electric Machine, an apparatus for generating electricity by revolving a coil of wire in the field of a permanent magnet or series of magnets. The machine depends upon the induction which takes place between magnets and coils of wire when their relative positions are changed. The distinction between the magneto and dynamo electric machines is that in the former a permanent magnet is employed, while in the latter its place is taken by an electromagnet.

A simple form of magneto machine consists of a horseshoe magnet before the poles of which two bobbins wound with insulated copper wire and inclosing cores of soft iron are made to revolve. The variation in magnetic intensity and polarity as these soft iron cores alternately approach and recede from the poles of the permanent magnet produce induced currents in the wire of the bobbins. These currents are reversed for each half-revolution, and hence a machine of this type produces an alternating current. By the use of a commutator, however, the current may be rectified, so that it passes through the connecting wire always in the same direction.

In another form of magneto the soft iron core is in the form of a ring, about which a number of separated coils of insulated wire are wound, with their ends taken to the central axis. This circular armature revolves between the poles of the horseshoe magnet, and the result is the generation of a current in one direction in one-half of the coils, and in the opposite direction in the other half. The current is taken off for the outside circuit by means of two metallic brushes on each side of the central axis.

For the generation of electricity in large quantities the dynamo machine is now generally used; but magneto machines are used for a variety of purposes where it is desirable to use alternating currents, and the establishment of the automobile industry opened up an immense field for them.

The magneto is used in gasoline motor cars, or those employing the internal combustion engine, as the electric generator or source of the current to cause the spark which ignites the combustible mixture. Its effect is that of a small dynamo. It is driven from the motor shaft and supplies current through a small storage battery for use in starting the engine, lighting the car, etc. The magneto is not liable to stoppage of its current, nor to change of voltage, and practically eliminates the renewal of the battery cell.

Magnetos are also used for ignition purposes in motor boats, where the installation is by means of gears, chain, and sprocket, or by frictional contact with the flywheel; also in connection with the ignition systems of airplane motors.

Telegraph circuits which are not operated with voltaic batteries sometimes employ magneto machines, and they are also frequently used on telephone circuits for ringing bells. In quarrying, mining, and other activities where blasting is required, magnetos are used for generating electric current to be conveyed from a safe distance, by means of insulated wires, to explode the charge by heating a platinum wire which terminates in a fulminate cap.

Magnolia, a genus of trees and shrubs characterized by thick, often evergreen, leaves and showy terminal flowers. Named for Pierre Magnol (1638-1715), a French botanist. There are fifteen species in all, confined to eastern North America and subtropical Asia. Some are only shrubs. Magnolia wood is white and is considered desirable for cabinet work. The Japanese use the wood of a native variety for lacquered work. The common American magnolia is a stately tree with broad evergreen leaves from one to three feet long. It bears fragrant white flowers, four to twelve inches in diameter, in full bloom from early May until the end of June.

Magpie, a noisy, chattering bird of the crow family, closely allied to the jay. The

common magpie of Europe, found also in Asia and America, is lustrous black, with green, purple, and violet sheen. The upper part of the breast and a portion of each wing is white. The adult is from fifteen to twenty inches in total length, of which a good half must be allowed to a diamond or trowel-shaped tail. The magpie is full of mimicry and audacity. It builds a bulky nest, usually in shrubbery, and is noted for the theft of numerous small articles to which it takes a fancy, giving rise in English households to serious inconvenience. Servants have not infrequently been accused of stealing tableware and jewelry which had in reality been purloined by some thievish old magpie. The eggs are from four to eight in number. See JAY; JACKDAW; CROW.

Mahabharata, mä-hä-bhä'ra-ta, one of the great national epic poems of ancient India, and one of the great epics of the world's literature. The title *Mahabharata* signifies "The Great Poem of the Bhâratas." The word Bhâratas means the descendants of King Bhârata. The poem consists of eighteen cantos and contains 200,000 verses. It is about eight times as long as the *Iliad* and *Odyssey* combined. It is evidently a compilation. About one-fourth of the whole work is concerned with the main story, which is an account of the feud between two rival branches of the royal line. The rest of the poem consists of episodes and incidents of mythological history, interspersed with much that is didactic and even dogmatic. The Hindus ascribe the poem to Vyasa, a name which signifies "arranger," and is thought to imply the composite nature of the poem. Various parts of the work, it is evident, had been collected under the present title as early as 350 B. C., but it is uncertain to what extent the poem has been changed, or what additions have been made since that date. The moral teaching of the poem is of a lofty character. Certain parts show high literary merit; and, while much of the subject matter seems grotesque and absurd, it is hardly to be wondered at that the study of the *Mahabharata* became an important part of the education of Hindu youth, just as a knowledge of the *Iliad* was deemed essential to the Greek. As yet, only portions of the *Mahabharata* have been translated into English. Some of the stories related in this epic have been used, however, by English authors. The old story of the pound of flesh used by Shakespeare in the *Merchant of Venice* can be traced to this source. See LITERATURE; EPIC; MERCHANT OF VENICE.

Mahan, Alfred Thayer (1840-1914), an American naval officer and author, a world authority on the sea power of the nations. He was born at West Point, N. Y., and was graduated from the Naval Academy in 1859. He thereupon entered the naval service as a midshipman. He was advanced to the rank of lieutenant, 1861; lieutenant commander, 1865; commander, 1872; captain, 1885; and after retirement by his own request after 41 years of service, was advanced in 1906 to the rank of rear-admiral on the retired list. Rear-Admiral Mahan served in the War of Secession. He took a very active part in the establishment of the Naval War College, was its president from 1886 to 1889, and was on special duty at the College when retired. At the outbreak of the Spanish-American War in 1898 he was called to Washington as a member of the Naval War Board, and in 1899 was chosen delegate to The Hague Peace Conference. Rear-Admiral Mahan held honorary degrees from numerous American and British universities. His published works, which have had a strong influence on military men, statesmen and diplomats, include *The Influence of Sea Power on History 1660-1783,* reputed to have been the late German Emperor's inspiration and guide in building his navy; *Life of Nelson, Lessons of the War with Spain, Interest of America in International Conditions, Armaments and Arbitration* and *Problems of Asia.*

Mahanoy City, Pa., an industrial borough, is on the Schuylkill River and on the Lehigh Valley and Philadelphia & Reading railroads, 50 miles north by west of Reading. The city is in the center of the east-central anthracite coal fields, and has numerous and extensive mining and shipping interests. Other industrial plants are shirt factories, lumber mills, flour mills and knitting mills. Population, 1920, 15,599.

Mahdi, in the Mohammedan religion the name given to the expected Messiah or messenger of Allah who is to establish a reign of truth and justice on earth by destroying the infidels and apportioning the world's goods equally among the faithful. The word Mahdi means "the guided one" and implies that the Mahdi, being guided himself, will be able to guide others. Tradition ascribes the foretelling of the Mahdi's coming to Mohammed, although it is not mentioned in the Koran. From time to time false Mahdis have arisen in Persia, Syria, Turkey, and Egypt, who have prosecuted religious wars but without lasting results. One of these, the "Veiled Prophet of Khorassen," was worshiped for centuries in Arabia. His story is told in Thomas Moore's Lalla Rookh. The Mahdi designated most commonly by that title, however, is Mad Mullah, or Mohammed Ahmed who contested with England for the Sudan. This Mahdi was born about 1844, and in his youth became learned in the occult sciences which, together with his political genius, helped him to win vast riches and a large following in the country between the Blue and the White Nile. After winning several victories in the Sudan, the Mahdi's army obtained possession of Khartum, General Gordon who had resisted them for ten months being killed. The Mahdi died the same year of small-pox, but the English troops who had been sent to relieve Gordon, arriving too late, abandoned the field. It was thirteen years before the British again occupied Khartum. See GORDON; SUDAN.

Mahogany, ma-hŏg'a-ny, a large forest tree of the West Indies and Central America. There is but a single species. The leaf resembles that of the ash tree. The flowers are small and five-parted. They are borne in panicles. The fruit is a pear-shaped woody capsule packed with winged seeds. The tree is prized chiefly for lumber. Trees from Central America afford boards four feet wide. The wood is close-grained, free from shakes, and has a rich, dark red color. To these desirable qualities may be added freedom from a tendency to warp. The wood is prized by cabinet-makers. Solid mahogany was at one time considered the most expensive and valuable furniture made. The wood is now cut usually into thin sheets which are glued as veneer on frames, panels, and the like. The best lumber is cut green and is conveyed by ship to the purchasing countries, as, if allowed to float in sea water for any length of time, the logs are likely to be attacked by marine borers. Aside from expense, mahogany is desirable wood for inside finishing work. It is considered a second-class wood for shipbuilding purposes. Immense quantities of mahogany lumber have been exported to Great Britain, France, Germany, and the United States, but the relative demand has fallen off of late owing to the introduction of metal furniture and a return to local woods of a lighter color. The cultivation of mahogany has been introduced into the northwest provinces of India. See LOGWOOD.

Mahomet. See MOHAMMED.

Maiden, The Iron, See NUREMBERG.

Maid of Orleans. See JOAN OF ARC.

Maidenhair. See FERN.

Mail. See ARMOR.

Maine, the largest of the New England states and the most northeasterly state of the Union. The most popular name of Maine is the "Pine Tree State," which derives from the tree that predominates in its 15,000,000 acres of forests. Another name for the state is "hundred harbored Maine," an allusion to the greatly indented coast line. Maine has an area of 32,935 square miles, 3,040 of which are water.

PHYSICAL FEATURES. The scenic beauty of Maine is well known. There are 1,600 forest-edged lakes, and the land is in the main gently rolling. The northern end of the Appalachians crosses the state from southwest to northeast in the form of a plateau. Two other ranges of hills cross the state, one rising northward from the southern coast, the other crossing from east to west. This makes the interior of Maine quite hilly. The general slope is from the center northward to the St. John river and southward to the coast. This southern coast is very rugged, and eastward from the Kennebec River rises to elevations from 1,000 to 1,500 feet high. In the

center of the state is Mount Katahdin, 5,385 feet high. Farther west are Mount Bigelow, 3,600 feet high, and Mount Abraham, 3,388 feet. Two lesser peaks are Mount Blue, and Mount Kineo, dominating Moosehead Lake.

It is estimated that 6,000 streams and rivers whose waters are of unusual purity form a sparkling network across the state. The St. John River traverses the northwest corner of the state, forming a part of the boundary with New Brunswick. The principal rivers, however, flow southward toward the coast. From west to east they are Salmon Falls, Saco, Androscoggin, Kennebec, Penobscot, Union, Narroguagus and St. Croix. Few of these rivers are navigable for more than a score of miles, but because of their swiftness they are of great industrial value.

Moosehead Lake, the largest body of water in the state, has an area of 120 square miles. It is the source of the Kennebec River and is the largest inland body of water in New England. The Rangeley Lakes, from which the Androscoggin rises, have an area of 90 square miles. Chesuncook Lake, connected with the Penobscot River, and Chamberlain Lake, from which the St. John flows, are also quite large.

Down the Maine coast runs a chain of about 300 islands, which protect the harbors from wind and sea. The harbors are many, and a great number of them are deep, commodious and well protected. An idea of their number may be derived from a consideration of the fact that, measured in a straight line, the coast is about 200 miles long, while the actual measurement is approximately 3,000 miles.

Climate. Though it lies in the center of the temperate zone and is divided by the 45th parallel of North latitude, the temperature seldom rises above 70° in summer. The lower ends of the Arctic currents touch Maine and make it a far colder state than many others in the same latitude. The winters are severe, except along a narrow strip of coast, and sudden changes of temperature occur at all seasons. The average rainfall is 40 inches. On the coast the snowfall averages about 60 inches, and 110 inches in the north and west. Because of its cool healthful climate, however, Maine is popular with pleasure seekers from the hotter states down the Atlantic Coast.

The People. By the fourteenth census of the United States the population of Maine was given as 768,014. About one-seventh—107,349—were foreign born and 1,310 were Negroes. The foreign born consist almost entirely of French Canadians, but the Scandinavian countries are fairly well represented. In 1920, 39.0 per cent of the population was urban, and the density of the total population was 25.7 to a square mile. Portland is the only city with a population exceeding 50,000. The capital, Augusta, has 14,114 inhabitants.

Minerals. The principal minerals of Maine are granite, slate, limestone and feldspar. The fourteenth census places Maine seventh as a producer of granite, with an output valued at $1,300,996. The state usually holds third place for slate production, and it also produces feldspar in large quantities. The making of lime from the streaked limestone found here engages many people.

Agriculture and Forestry. The sandy soil strewn with gravel that is found in the greater part of the state is quite sterile and little or no attempt at cultivation is made. But in some of the river valleys, particularly in the valley of the Aroostook, the soil is very fertile. In the Aroostook Valley are grown potatoes of a superior quality which are much in demand for seed both in the United States and abroad. Hay is the next crop in importance; and in smaller quantities oats, corn, buckwheat and wheat are grown. Dairying is the important branch of the stock raising industry.

Maine's 15,000,000 acres of forests comprise chiefly pine and spruce, though birch, poplar, maple and cedar are also found. The spruce forests are the most extensive. No large amount of virgin pine now stands, but the second growth is abundant and valuable.

In order that Maine be not denuded of forests, the state government makes an annual appropriation of about $100,000 for the maintenance of state forests. The state also greatly assists the Federal government in protecting against forest fires.

Fisheries. Maine's deep-sea fisheries are its oldest industry. Among the New England states it is exceeded only by Massachusetts in the value of its fishery products. In the Penobscot River, salmon are caught, and cod, halibut, haddock, herring, mackerel, smelts, lobsters, clams and scallops are taken off the coast. Numerous lobster hatcheries have lately been established, and the lobster supply is protected by the state.

Manufacture. Aided by abundant water power and cheap and easy transportation, manufacturing is very important and is steadily growing. Of first importance is the manufacture of paper and wood pulp, and lumber milling. Large quantities of cotton and woolen goods are made, and the product of the boot and shoe factories is very valuable. There are many flour and grist mills, and along the coast are extensive fish drying and canning establishments. The construction of wooden ships is not as important as formerly, but the ship yards of Maine have not entirely disappeared. The shipbuilding center is Bath, and the other important manufacturing cities are Waterville, Augusta, Bangor, Portland and Lewiston.

Transportation. While but few miles, comparatively, of the many miles of rivers are navigable, and are used only to float timber from the interior to the coast, Maine has ample transportation facilities. There were 2,269 miles of steam road in 1922, and several interurban electric lines. Along the coast the roads are very good. The railroads are the Boston & Maine, Maine Central, Sandy River & Rangeley Lake, Grand Trunk, Canadian Pacific and Bangor & Aroostook.

Institutions. The charitable and correctional institutions are under the control of a state board of inquiry. The institutions for correction are the State Prison, Thomaston; State School for Boys, South Portland; and the Maine Industrial School for Girls, Hallowell. The hospitals include the Augusta State Hospital and the Bangor State Hospital. Other institutions are the Healy Asylum for Boys, Maine Children's Home Society, Temporary Home for Women and Children, Eastern Maine Orphans' Home, Bath Military and Naval Orphan Asylum and the Maine School for Feeble-Minded.

Education. Educational history in Maine begins in 1800, when the state was still a part of Massachusetts. In that year the district system was established and a state board of education was created forty-six years later. Primary education is compulsory, and is free to everyone from five to twenty-one years of age. But because of the widely scattered rural population there are still many who are unable to take advantage of the educational opportunities that are offered.

The University of Maine, at Orono, is the highest educational institution in the state. There are normal schools at Presque Isle, Fort Kent, Gorham, Farmington and Castine. At Waterville is Colby College, and Bates College is at Lewiston. Bowdoin College, at Brunswick, is notable as the *alma mater* of several well known American literateurs. For their names see Bowdoin College.

The University of Maine was founded in 1865 under the name of State College of Agriculture and Mechanic Arts. The present name was given in 1897. This institution, with the corresponding institution of Vermont, are the only state universities in New England. It comprises colleges of arts and sciences, technology and agriculture. The Maine Agricultural Experiment station is also a department of the university. It confers degrees in philosophy, chemistry, forestry, agriculture, engineering, science and home economics. The student body numbered 1,460 in 1922, and the faculty, 119.

Government. Maine is still governed under its original constitution, adopted in 1819; this instrument has been amended many times, however.

The legislature is divided into two houses —a senate of 31 members and a house of representatives of 151 members. All legislators are elected at the same time and for two-year terms.

The executives are the governor, advised and assisted by a council of seven members elected biennially by joint ballot of both branches of the legislature; and a sec-

retary of state and a treasurer, chosen as the advisory council; and an attorney-general.

Judicial power is vested in a supreme court of eight justices appointed by the governor; and in superior courts, probate courts and municipal courts.

History. It is believed that the Norsemen under Thorwald visited Maine in the eleventh century, but accurate history does not begin until Verrazano discovered the Gulf of Maine in 1524. The coast was later explored by De Monts, the Cabots, John Smith, Gosnold and Weymouth. De-Monts secured a charter from Henry IV of France in 1603 for the territory between 40° and 46° N. latitude; this he named Acadia. Other parts of the state were granted to other persons, and in 1641 Georgiana, the first incorporated town in America, was founded on the site of the present York. Massachusetts bought the province in 1677, and it was incorporated as a part of that state in 1692.

Maine served England during the French and Indian Wars, the colonies in the Revolutionary War, the Union in the War of 1812, and in 1820 was admitted to the Union. Twenty-two years later the present boundaries were defined by the Webster-Ashburton Treaty. Maine fought on the northern side in the Civil War.

Statistics. The following are the latest statistics available from trustworthy sources:

Land area, square miles	29,895
Water area, square miles	3,040
Forest area, acres	15,000,000
Population (1920)	768,014
White	765,695
Negro	1,310
Indian	839
Foreign born	107,349
Chief cities:	
Portland	69,196
Lewiston	31,707
Bangor	25,948
Biddeford	18,008
Auburn	16,985
Augusta	14,114
Bath	14,731
Waterville	13,351
Number of counties	16
Member of state senate	31
Members of house of representatives	151
Salary of governor	$5,000
Representatives in Congress	6
Assessed valuation of property	$637,403,433
Bonded indebtedness	$8,483,300
Farm area, acres	5,425,968
Improved land, acres	1,977,329
Oats, bushels	4,340,000
Potatoes, bushels	37,152,000
Buckwheat, bushels	351,000
Wheat, bushels	187,000
Barley, bushels	104,000
Hay, tons	996,000
Wool clip, pounds	973,000
Domestic Animals:	
Horses	104,000
Milk cows	171,000
Other cattle	129,000
Sheep	140,000
Swine	97,000
Manufacturing establishments	2,995
Capital invested	$419,158,006
Operatives	88,651
Raw material used	$254,568,523
Output of manufactures	$456,821,783
Quarry products	
Miles of railway	2,269
Teachers in public schools	5,732
Pupils enrolled	354,079

See Granite; Paper; Mount Desert Island; Kennebec River.

Maintenon, màn-tĕh-non′, **Françoise D'Aubigne Marquisse of** (1635 - 1719), the second wife of Louis XVI. She was born in prison. At her mother's death she was left penniless and dependent on an aunt, who brought her up like a peasant girl, placing her in charge of the poultry. A famous pamphleteer and man of letters by the name of Scarron, being attracted by her wit and cheerful disposition, offered to pay for her education in a convent or take her for his wife. She chose the latter alternative and made his home the center of the literary people of Paris. In 1660 Scarron died leaving his wife in poverty. She was recommended to Madame de Montespan, the mistress of Louis XIV, as a suitable person to educate her children. In visiting his children, Louis made the acquaintance of Madame Scarron. She was given a fine home and a liberal income, and was made Marquis de Maintenon. Despite the jealousy of the queen, Madame de Maintenon acquired and maintained an influence over the king, and conducted herself in such a way amid the frivolities of a dissolute court as to win the respect of all who knew her. It is said she favored the revocation of the Edict of

Nantes. In 1685, two years after the death of the queen, Madame de Maintenon was married to the king privately. He did not acknowledge her as the queen. It was well understood, however, that she was for many years the power behind the throne. According to all accounts, she did what she could to restrain the debauchery of a licentious court, and exercised her influence always on the side of decency. While it is impossible for a woman to hold the relation that she did to a king without creating gossip, it may be said truthfully that she came through it all with a reputation unblemished. She survived the king four years. She spent the latter part of her life in a school for girls at St. Cyr. This was a school that Madame Maintenon, ever mindful of the trials of her girlhood, had established in the days of her prosperity for the daughters of good families that found themselves in greatly reduced circumstances.

Mainz, mīnts, or **Mayence,** mā-ŏns′, a city of the Rhine. It is situated on the left bank opposite the mouth of the Main. The Rhine is spanned by a stone bridge which has replaced a former and more picturesque bridge of boats. The city has a population of 110,634 and is an important center of trade in grain, flour, wine, coal, and wood. It has busy factories of leather, furniture, hardware, tobacco, beer, carpets, soap, hats, chemicals, musical instruments, and silverware. It is a military point of strength. The interest of the traveler centers in the antiquities. Mainz was originally a Celtic stronghold. It was occupied as a Roman fortress, 14 B. C., and became an important trading point. Christianity was introduced about 550. The city was favored by Charlemagne and it was for centuries the center of church affairs in the German Empire. It was also the center of a league of Rhenish towns engaged in trade. Such was its prosperity that it was known as the "Golden Mainz." A cathedral, partly Gothic; the citadel; a monument, said to have been erected by the Roman legions in honor of the Roman Drusus, 9 B. C.; the ancient palace of the archbishop, now a library, and a rich museum of Roman and Roman-German antiquities; the ancient cemetery in which Roman soldiers were buried; the quaint old streets; the promenades, pleasure gardens, and flowing Rhine, —all attract the tourist's attention. The house in which Gutenberg set up the first printing press still stands. A statue in his honor, designed by Thorwaldsen, was erected in Gutenberg Square in 1837. See GUTENBERG; RHINE.

Mair, Charles (1838-), a Canadian poet and journalist, was born at Lanark, Ontario, and received his education at Queen's University, Kingston. Though he began to contribute verse and prose sketches to the press while still quite young, his first volume, *Dreamland and Other Poems,* did not appear until he was thirty. Before 1868 he had removed to Fort Garry, and was the Fort Garry correspondent of a Montreal paper at the time of the Red River Rebellion, 1869. At this time Mr. Mair was made prisoner and was even sentenced to death. He managed to escape, however, and served as a medical officer during the Saskatchewan Rebellion. Mr. Mair made a close study of the Indians with whom he came into contact during these years, and when his *Tecumseh* appeared in 1868 it was acclaimed as a fine character study. His other important works are *Through the Mackenzie Basin, The Last Bison, The Fountain of Bemini* and *The Conquest of Canada.*

Maissoneuve, Paul de Chomedy, Sieur de (?-1676), the founder of Montreal, was a French colonial governor for twenty-two years. Entering the French army and serving in Holland, he later became interested in the plan to found a religious colony in New France. He gathered a small band, forty men and four women, and set sail, reaching Quebec in 1641. He founded Montreal in the next year. Trouble with the Indians and with the jealous governor of Quebec followed, but Massoneuve overcame all obstacles, even continuing as governor of Montreal after the Sulpicians gained control. The Quebec government was hostile of Montreal because of the colony's continued independence, and it was because of this that Maissoneuve was removed from the governorship in 1665 and sent to France. This was the mortal blow to a fearless

and able man, for he sank into obscurity in France, and died poor and practically friendless.

Maize. See CORN.

Majolica, a kind of pottery. Genuine majolica, the majolica of collectors, is a tableware made in Italy, especially in the island of Majorca, during the fifteenth and sixteenth centuries. It is made of a coarse clay paste covered by raised decorative enamel in wondrously attractive, intense colors. The work was done by hand. The most noted artists of the day took pride in majolica decorations. The designs and central figures were executed with as much fidelity as the finest sculptures and oil paintings. A number of Raphael's famous paintings were copied in the decorations of this ware. In modern pottery-making the majolica style of ware is considered especially appropriate for vases and pitchers.

Major, in military affairs, the field officer of a regiment ranking next below the colonel and the lieutenant colonel. In line of battle the major's position is behind the left wing of his regiment. In case of the absence or disability of his two superiors the major assumes command of the regiment. In the United States infantry the major receives a salary of $2,500 to $3,500, according to the length of his service. See ARMY.

Malaga, a city of Spain situated on a small arm of the Mediterranean, a few hours' sail northeast of Gibraltar. It was a city of some importance under the Romans, and was an important center during the Moorish occupancy. The remnants of ancient fortifications, including a Moorish castle, may still be seen. The modern city has a population of 527,249. It is noted for manufactures of soap, linen, and cotton cloth, and for large exports of oranges, almonds, Malaga raisins, Malaga grapes, Malaga wine, and bar lead. Rich iron mines in the vicinity have given rise to the manufacture of machinery. The climate is considered especially delightful.

Malaria, a term including several fevers, as fever and ague, chills and fever, etc. Malaria is now believed to be due to a minute animal which multiplies rapidly when once introduced into the blood. Since 1894 scientists have demonstrated with reasonable certainty that the germs of malaria are drawn by a mosquito with the blood of a sick person, that they multiply in the mosquito's body and after a reasonable interval are injected into the blood of a second person through the sting of the insect. It is held that a person can be infected with malaria in no other way. The term *mal-aria* is Italian, signifying bad air. It was supposed formerly that malaria lurked in low, damp places, where it contaminated the air, but modern science has demonstrated that people contract malaria in these low grounds only because they afford breeding places for a certain dapple-winged mosquito that transfers the germs from one person to another, as it busies itself drawing blood.

There are several malarial fevers. One of the most common is the so-called ague, in which patients pass alternately from chills to fever and sweating. A chill lasts from a few minutes to an hour, the fever from half an hour to four or five hours; then comes from half an hour to two hours of perspiration. The total duration of a round is from eight to twelve hours. The traditional remedy for malaria is quinine, which acts as a germicide; that is, when taken into the system, it kills the minute germs to which the disease is due. In 1920 3,136 deaths from malaria were reported in the United States, considerably less than previously reported.

The mosquito-infected region of the Campagna near Rome is noted for malaria. It has been found that by living within mosquito-proof screens, especially at night, persons may live in the worst malarial districts with safety. See MOSQUITO.

Malays, the dominant people of southeastern Asia, Malaysia, and Polynesia. They are considered a branch of the Mongolian stock. The typical Malay is short of stature. His hands and feet are small and delicate. He has an olive brown complexion, a round head, straight hair, high cheeks, and slightly oblique eyes. He has the self-composure and ceremonious manners of an American Indian and is equally revengeful and cruel. It is said to be difficult to distinguish a typical Malay from a

typical Chinaman. They have received, however, an admixture of white blood from India and of negro blood from Africa. Descriptions of the Malays, therefore, differ considerably, according to the locality in which they live. The Hovas of Madagascar and the Tagals of the Philippines are Malays modified by negro blood. As a whole, the Malays are an active, conquering race. Before the practice was suppressed by European nations, they were noted pirates. As a race they were converted to Mohammedanism by the Arabs. Previous to this date, they appear to have had no written literature. At all events, Arabic characters are used by the priests. Although the Malay peoples differ greatly there are certain general characteristics. They surpass in hunting, fishing, boating, and woodcraft. A great number of native proverbs are widely current among them. They are courteous in their communications with each other, but show little joy or sorrow. The custom of running amuck is widespread. The typical Malay is fond of cock-fighting. He dislikes milk. On marrying, the husband enters the wife's family. In school, Malay children are considered quite inferior to the Chinese. See JAVA; PHILIPPINES.

Malden, Massachusetts, a city in Middlesex County, situated on the Malden River, 5 miles north of Boston, on the Boston & Maine Railroad. It is connected by many interurban lines with neighboring towns. There are several fine buildings, notably Converse Memorial Hall containing an art gallery, library and auditorium, court house and a Y. M. C. A. building. There is also a Home for Aged Persons and a hospital.

Malden has a large number of manufacturing establishments, including one of the largest shoe and rubber works in the United States. There are also factories producing glue, cords and tassels, sand paper, emery paper, lasts for boots and shoes, leather, etc. Malden covers an area of about 5 square miles. It was first settled in 1640, and was chartered as a city in 1881. Population, 1920, 49,103.

Mallard, an old French word, allied to male, and signifying a wild drake or male of the common wild duck (*Anas boschas*). By extension, the term is applied to both sexes of the common wild duck. The mallard is one of the most widely distributed ducks. It is intelligent and strong of wing. It ranges throughout the north temperate zone, nesting in China, Siberia, northern Europe, Canada, and the northern United States, and migrating as far southward as Panama and India for the winter. The nest is a basket of grass, lined with down from the breast of the duck. Eggs, about fourteen. The drake is a bird of fine carriage and is about twenty-two inches long. He has a brilliant, metallic-green head and neck. The breast is chestnut; the back is a pearly gray; the wing is trimmed with rich purple; the long black upper tail-coverts are recurved. The mallard is distinctively a duck of the interior, breeding in grassy situations near water. See DUCK.

Mallory, Stephen Russell (1813-1873), an American lawyer and political leader upon whom developed the Herculean task of building the Confederate navy. He was born in Trinidad, West Indies. In 1832 he was appointed by President Jackson inspector of customs at Key West, Florida. Admitted to the bar in 1839, he practiced for a time, and subsequently served in the Florida War against the Seminole Indians. During 1851-1861 Mr. Mallory was United States Senator from Florida. When that state seceded from the Union in 1861, Mr. Mallory was chosen Secretary of the Confederate Navy, then existing in name only. His only preparation for this important post was his experience as Chairman of the Senate Committee on Naval Affairs. Nevertheless, he built a navy. The ship timbers still stood in the forest and the metals were in the earth. Mr. Mallory saw to it that they were gotten out. Ordnance and machinery had to be built. After the navy became a floating reality, Mr. Mallory had to administer it. Yet none of these tasks proved too hard. He was held prisoner for a year after the close of the war, but was finally pardoned by President Johnson in 1867.

Mallow, a dooryard plant allied to the hollyhock. There are several mallows

The upright, curled mallow, with crisped leaves, and the common trailing mallow produce flat circles of wrinkled seed known to children as "cheeses." The Marsh mallow is a shrubby seashore plant of another genus. Its gummy roots are used for medicinal purposes and for flavoring.

Malt. See Beer.

Malta, mal'ta, an island in the Mediterranean sixty miles south of Sicily. It rises from a north and south submerged ridge that divides this sea into an eastern and a western basin. The rocks and caves of Malta have preserved the fossil remains of plants that grew, and birds that flew, and gigantic lizards that crept, in previous geologic ages. The soil is fertile. Malta has a total area, with Gozo and Comino, of 118 square miles, and a population of 228,534. The chief town and port is Valletta. The island has 102 public schools, a university with 6 faculties, a lyceum, and secondary, and technical manual schools. The chief products are wheat, meslin, barley, potatoes, onions, grapes and other fruits, and cotton. The principal manufactures are lace, cotton textiles, filigree and cigarettes. The chief industry is farming, while in 1919-20 fishing gave employment to 3,500 persons. There are some 8 miles of railroad in Malta, and telegraph and telephone lines. British coin and government currency notes are the legal tender.

The island lies midway between Gibraltar and the Suez Canal, and has a fine harbor. It has been called the key to the Mediterranean. During the Crusades, Malta became a port of importance. In 1530 the Knights of St. John, or Hospitallers, were granted Malta in perpetual sovereignty by Emperor Charles V. They held the island against the persistent assaults of the Turks, making it a bulwark of Christendom. A richly decorated church, that of St. John, and many magnificent palaces, as well as other buildings, still attest the wealth and power of the order. In 1798 Napoleon took the island. In 1800 Admiral Nelson starved out the French garrison. The island is still in possession of the British, who have made it a stronghold second only to Gibraltar.

Malthus, măl'thŭs, **Thomas Robert** (1766-1834), a political economist of England. He was educated for the church, but led the life of a college professor. Malthus is known for his famous *Essay on the Principles of Population,* published in 1798. In this work he set forth what is known as the Malthusian Doctrine, to the effect that the population of the world has a tendency to increase much faster than the food supply, resulting in crowded centers of population and consequent misery. He took a very serious view of the situation and urged upon parents the propriety of raising small families, a doctrine directly opposite to that of President Roosevelt and others with greater confidence in the future of civilization. According to Malthus, population increases geometrically as 3, 9, 27, 81, 243, etc., while the means of support increase arithmetically as in the series 3, 6, 9, 12, 15, etc. This doctrine leaves out of account both the influence of scientific inventions upon the food supply and a probable tendency in dense populations to decrease the birth rate.

Malvern Hill, an eminence near the James River, 15 miles southeast of Richmond, where on July 1, 1862, a battle was fought by a Union army of about 80,000 men under General McClellan, and the Confederate army of Northern Virginia, also numbering about 80,000, under General Lee. The Confederates were defeated, the estimated loss being 5,000, while the Federals lost about one-third of that number. This was the last of the "Seven Days' Battles" in the Peninsular Campaign.

Mamelukes, a cavalry famous in Egyptian history. When Genghis Khan overran western Asia he subjected the conquered people, including 12,000 Circassians and Turks, to the Arabic Sultan of Egypt. Superior mentally to their masters, they became insubordinate, and in 1254 they assassinated the sultan and appointed one of their own number his successor. They dominated Egypt for 263 years. A massacre ordered by the Turkish pasha exterminated them in 1811.

Mammals, the highest class of vertebrates. It contains all those animals that

suckle their young and no others. With the exception of a small group of Australian animals represented by the duckbill, all mammals bring forth their young alive. They are warm-blooded and breathe air. Their skin is more or less hairy, rarely naked. Some of the principal families included in the mammals are man, the monkeys, the bats, the hedgehogs, the shrews, the moles, the bears, the raccoons, the dogs, the cats, the weasels, the seals, the hares, the squirrels, the porcupines, the rats and mice, the sloths, the cattle, the goats, the sheep, the antelopes, the giraffes, the deer, the camels, the horses, the elephant kind, the swine, the seal, the whale kind, the ant-eater, the opossum, the kangaroo, and the duckbill. There are over 3,000 different species of animals that suckle their young. The greater number of mammals live on land, but some, like the walrus, seal, whale, manatee, and dugong, are adapted to a life in the water. One mammal, the bat, is aerial. See the articles describing the various families of mammalia enumerated above.

Mammon, a Syriac word used in the New Testament as the personification of worldliness. In Syrian mythology, Mammon was the god of wealth, corresponding with the Greek Pluto. The word has thus come into common use to designate the personification of avarice. The name is of frequent occurrence in literature. In Ben Jonson's *Alchemist,* Sir Epicure Mammon is a worldly sensualist who finally overreaches himself and defeats his own ends. In Spenser's *Faerie Queene,* Mammon is the money god whose cave is visited by Sir Guyon, whom Mammon tempts unsuccessfully with all forms of wealth and pleasure. Milton gives the name of Mammon to a fallen angel of sordid character.

Thither, winged with speed,
A numerous brigade hastened: as when bands
Of pioneers, with spade and pickaxe armed,
Forerun the royal camp to trench a field
Or cast a rampart. Mammon led them on—
Mammon, the least erected Spirit that fell
From Heaven; for even in Heaven his looks and thoughts
Were always downward bent, admiring more
The riches of Heaven's pavement (trodden gold)
Than aught divine or holy else enjoyed
In vision beatific: by him first
Men also, and by his suggestion taught,
Ransacked the Center and with impious hands
Rifled the bowels of their mother earth
For treasures better hid. Soon had his crew
Opened into the hill a spacious wound,
And digged out ribs of gold. (Let none admire
That riches grow in Hell—that soil may best
Deserve the precious bane!)

Mammoth, an extinct elephant with enormous tusks much more curved than those of existing species. During a former and colder age this animal used to roam in herds over the plains of Siberia, feeding on the leaves of the spruce and fir tree. Bones of the mammoth have been found in North America from Bering Strait to South Carolina, and in Europe from the Arctic Ocean as far southward as Italy and the Pyrenees Mountains. Early in the nineteenth century a hunter discovered one embedded in the mouth of the Lena River in Siberia. He waited until the animal had become somewhat exposed by the melting of the ice. He then cut off its tusks which he sold for ivory. Although the animal must have been in the ice for centuries, it was perfectly well preserved. Bears, wolves, foxes, and other wild beasts fed on it until a Mr. Adams of the Academy of St. Petersburg, hearing of the remains, took steps to preserve what was left from destruction. He found the skeleton almost entire and a part of the skin on the side on which the animal had lain. Even the weight of this fragment of skin was so great that ten persons were required to carry it to his boat. The tusks were recovered, and the skeleton was mounted in the museum of the Academy at St. Petersburg. This skeleton, from the forepart of the skull to the insertion of the tail, measures sixteen feet four inches. Its height is nine feet four inches. The tusks measure nine feet six inches along the curve, and six feet seven inches in a straight line from the base to the point.

Mammoth tusks have been found in great quantities all over Siberia, and have formed an important article of commerce, furnishing the so-called fossil ivory. The mammoth lived in what is known as the stone age of man. Other animals of this age were the cave bear, the cave hyena, and the Irish deer.

There is a popular impression that the mammoth was an animal of enormous size. In all probability it was little if any larger than the African elephant. The Siberian

peasants had never seen these animals on the surface of the earth, but they had seen their carcasses come up, apparently through the ice. They had a notion that the animals lived in the interior of the earth very comfortably, but that they died whenever they happened to approach the surface. These wild hunters, comparable to our American Indians, gave the animal the name of mammoth, meaning, in their language, a dweller underground. The idea of enormous size is one that white people have attached to the word.

As stated, the mammoth was not a tropical animal. It had a shaggy coat, warmer than that of a bear. It lived by cropping twigs of birch, alder, and other shrubs growing in sub-arctic climes.

See IVORY; ELEPHANT; MASTODON.

Mammoth Cave, a celebrated cavern in Edmondson County, Kentucky. It lies about eighty-five miles southwest of Louisville. It may be reached readily by rail. Described in the simplest language, it consists of a number of immense chambers formed in the limestone rock. The material of the rock layers has been dissolved and carried away by trickling water. The main cave is three miles in length and from 40 to 175 feet in width. Its height varies from 40 to 125 feet. A dome-shaped enlargement of this cave is oval in shape. It is 540 feet in length by 287 feet in width, and is 125 feet high. Stone arrowheads, remnants of torches, and other relics found here, show that it was an ancient meeting-place of the Indians. The entire series of caverns, known as the Mammoth Cave, exists in five different layers of rock, communicating one with another by means of pits and passages. A number of artificial shafts have been cut for the accommodation of visitors. About 150 miles of passageways have been mapped. The diameter of the district is about ten miles. Other regions branching off are as yet unexplored. There are numerous lakes and several underground streams. The largest of these is called Echo River, because of its echoes. Boats are offered by competent guides. The waters abound in fish that have been deprived of light so long that they have lost their eyesight. Crawfish, crickets, flies, beetles, and spiders found in the caves, where they have lived no doubt for many generations, have also lost the use of their eyes. Countless numbers of bats take refuge near the mouth of the cave. A trip through the cave is by no means disagreeable. Intense darkness prevails, but the air is pure and clear. Guides light up the way so that the wonderful stalactites, stalagmites, domes, pits, and channels may be seen clearly. One room, known as the Star Chamber, has a lofty black ceiling studded with clusters of snowy crystals. The temperature remains constant throughout the year at about 54° F. The cavern is owned by private parties, but a movement is on foot to make it a national park.

See CAVE.

Manatee, the Haytian name of a group of animals related to the whale, but having the thick skin and thin, stiff hair of a black hog. The common manatee is an aquatic animal with a huge, clumsy, seal-shaped body and a large, swollen, soft snout. It is called locally a sea cow. Like other animals of the whale kind, it is supposed to be a degenerate land animal. Its flippers, which are reduced legs, still retain quadruped-like claws. An adult is from seven to fourteen feet in length and weighs from 200 to 1,200 pounds. It lives in the quiet rivers of Southern Florida, in the West Indies, and in western Africa. The front teeth are wanting. The upper lip is split into two lobes, between which vegetation is seized. The animal feeds on manatee grass and other tender aquatic plants. It eats under water. Its presence may be known by bits of vegetation rising to the surface. The tail is spade-shaped and is the main reliance in swimming. The manatee does not come ashore. The cow stands erect on her tail in the water and holds her two calves to her breasts with her weak flippers. She seems very affectionate and solicitous for her young.

The manatee is a stupid, harmless, defenseless animal. In captivity the animal feeds on lettuce, cabbage, spinach, celery, and seaweed. The state of Florida issues permits authorizing the capture of specimens for aquariums. Otherwise, the killing or taking is prohibited under penalty of a fine of $500. The name of Manatee has been given to a county of Florida.

A manatee twenty to thirty feet in length, and weighing possibly 8,000 pounds, lived formerly in Alaskan waters. The navigator, Vitus Bering, and his crew were shipwrecked on Bering Island and were compelled to winter there. They would have perished of starvation had they not secured the flesh of the ponderous animal. It is believed that the last Arctic seacow was killed in 1854. See DUGONG.

Manchester, a manufacturing city of England. It is situated in the extreme southeastern corner of Lancashire, thirty miles east of Liverpool. It was originally a Roman camp. It became noted early in the fourteenth century for its woolens. It is still the greatest weaving center in England. With its suburbs, it produces more cotton cloth annually than any other city in the world. Six hundred power looms are not an unusual number for a single factory. In connection with the cotton mills there are bleaching works, establishments for printing calico, and dye works on an enormous scale. Cambric, calico, muslin, gingham, ticking, jeans, corduroy, silk, and mixed goods are manufactured. There are over 60,000 employes in the cotton mills alone. There are also manufactures of machinery, chemicals, paper, hardware, and electrical appliances. Large coal fields in the immediate vicinity supply an abundance of fuel. Until recently Liverpool was the seaport of Manchester. In 1894 the Manchester ship canal, connecting the city with the Mersey River, was constructed. Ocean steamers of the larger size now unload provisions and bales of cotton at wharves in the center of the city. The manufactured goods of the city are now shipped at its own wharves. The first railway ever constructed for the carrying of passengers was built from Manchester to Liverpool in 1825. A complete network of canals and railways now connects Manchester with all parts of Great Britain.

The rapid growth of Manchester and consequently the large body of citizens who were practically deprived of representation in Parliament, made that city a center of the Chartist agitation. Under the leadership of Cobden and Bright, Manchester made its influence felt on the side of free trade.

During the Civil War in America, the supply of raw cotton was cut off. The Manchester mills were idle. The weavers were without employment and much suffering ensued. It was before an audience composed largely of these weavers that Henry Ward Beecher made his noted defense of the cause of the North.

The city is celebrated for municipal improvements. The public library is one of the oldest, if not the oldest, free library in Europe. A large public hospital resulted from a movement started by Jenny Lind, who donated the proceeds of two concerts toward the project. The meeting hall of the Royal Exchange is one of the largest rooms in England. The finest public building is the Town Hall, completed in 1877. It is considered one of the most creditable municipal buildings in Europe. It has a tower 260 feet high. It contains a remarkable peal of twenty-one bells. Each bell bears a line from section 105 of Tennyson's *In Memoriam,* beginning, "Ring out, wild bells." The building cost upward of $5,000,000. Water is brought into the city from a reservoir situated in the hills twenty miles distant. The city owns its own lighting plant and system of street railways.

In the matter of municipal ownership, it is one of the most progressive cities in the world. Its educational facilities are excellent. Owen College has an endowment of $2,000,000. A number of other institutions have been consolidated with it to form Victoria University. Preparatory schools and public schools are maintained on a liberal scale. The population of the city in 1921 was 730,551.

Manchester, a manufacturing city in New Hampshire, on the Merrimac River. The Amoskeag Falls above the city furnish abundant water-power for manufacturing, the chief products of which are cotton goods, paper, locomotives, boots and shoes, needles, woodenware, woolens and knit goods, lumber, leather, furniture, wagons, and carriages.

Manchester is a bishop's see of the Roman Catholic church, and besides the cathedral there are two Roman Catholic hospitals, two homes for the aged, two orphanages, and several academies main-

tained by this church. St. Anselm's College, also Roman Catholic, is located there. Numerous public parks add to the city's attractiveness. The population in 1920 was 78,384.

Manchuria, the northeastern district of the Chinese Empire. It rests on the Yellow Sea. It borders on China proper, Mongolia, Siberia, and Korea. It is a region of mountain chains, large rivers, and wide plains. The waters of the greater portion are tributary to the Amur River. Area, 363,610 square miles. Population, about 20,000,000. Portions have several hundred inhabitants to the square mile. In point of area, range and severity of climate, and agricultural possibilities, Manchuria is not unlike Illinois, Wisconsin, Minnesota, and the two Dakotas. According to all accounts, the soil of the plains is deep and black. The water is excellent and the climate bracing. Cold winters and warm summers remind the readers of the upper valley of the Mississippi.

In 1644 the Manchurians, who are of a race akin to the Koreans, Japanese, and Chinese, invaded China and placed their leader on the Chinese throne. They established the seat of government at Pekin. The Manchurian dynasty, as it is called, has ruled in China ever since, and Manchuria has been held rather as a dependency. The Manchu language is the official language of the Chinese court. Mukden, the old capital of Manchuria, is surrounded by an outer and an inner wall, and has about 160,000 inhabitants. The royal cemetery is near the city. The tombs are approached by long avenues guarded by mammoth stone elephants. Mukden is regarded with affection and veneration by the Manchus, that is to say, the official class of Chinese. It is their Mecca, their holy city.

When the Russians were building the Trans-Siberian Railway, they "obtained permission" to take a short cut through northern Manchuria to Vladivostock. At the crossing of the Sangari they established administration headquarters and built the city of Harbin. It is situated on a noble waterway in the midst of a fertile region. Here the Russians built a government building worth nearly $1,000,000, railway shops, hospitals, a commercial school in which their young men learn Chinese, a trade school, a club house, a store for employes, a $30,000 hotel, and a Russo-Chinese bank. In all, over $15,000,000 was spent by the Russians in improvements. There were large flouring mills, warehouses and shops, manufactories, and a city of 28,600 Russians and Chinese where formerly the river flowed undisturbed. In 1903, before the Japanese War interrupted traffic, there were thirty through trains and eighteen local trains daily. It is needless to say that the city was strictly Russian. At the very southern end of the country, scarce 300 miles from Pekin, the Russians "leased" the promontory of Port Arthur and the port of Dalny. They built a railway southward from Harbin by way of Mukden to Port Arthur and Dalny. They proceeded to build docks and warehouses at Dalny, and converted Port Arthur into one of the most strongly fortified places in the world. Prior to the war with Japan, Russia had expended $200,000,000 in Manchuria. Soldiers poured into the country under pretense of guarding the new railroad from the attacks of brigands. Protest was made; Russia agreed to remove her military forces in 1903. When the time for evacuation arrived, even more soldiers came, and the Russian fleet got up a naval demonstration. Manchuria seemed to become a province of Russia by virtue of occupation.

Japan, seeing that with Manchuria and Korea under Russian rule her turn would come next, bought warships, trained her army, borrowed money and sprang at Russia for a struggle of life and death. The result of the war is well known. With the "consent" of China, Russia transferred Port Arthur and Dalny to Japan and yielded a large interest in the Harbin-Dalny railroad to the latter power. Nominally a province of China, Manchuria is really subject to management by Japan. The nations of the world have a commercial interest in Manchuria. The region seems likely to become one of the great wheat-producing centers of the world,—a competitor in the flour markets of Japan and China. Then, too, American merchants are eager to sell in Manchurian markets. There is a demand for machinery, cotton,

clothing, groceries, kerosene, canned goods, and a thousand manufactured articles.

The chief agricultural productions are millet, beans, wheat, barley, oats, corn, hemp, and tobacco. Sheep thrive. Fine grain-fed cattle and hogs are raised. Under Russian inspection, hams and bacon are prepared for market. There are manufactures of brick and distilleries of Russian vodka. The barley about Harbin is converted into beer. Manchuria exports many tons of soya bean oil every year. It is used in painting. The next export in point of value is raw silk. Other items are opium, ginseng, medicinal herbs, melon seeds, shrimps, deer horns, salt fish, musk, fur, bristles, hair, hides, skins, pearl barley, leaf tobacco, and mushrooms.

The chief reliance of the peasant farmer is the giant millet. It resembles broom corn in its growth, only it attains a height of eight to fourteen feet. The grain is used for stock and for bread. The stalks, as stout as those of sunflowers, are used for fuel and for fences. The leaves are braided into mats on which to sleep. The people live in slight huts. In winter, for want of glass, they paste sheets of oiled paper over their windows. Like the Chinese, they are Mongolians and Buddhists, but they are stronger, of a lighter complexion, and more progressive.

Immense forests of valuable oak, walnut, pine, and fir await sawmills. The panther, wolf, bear, deer, owl, eagle, and various fur-bearing animals, even the tiger, are found in the forests. Wild flowers grow in profusion. The mountains are known to contain mineral wealth, as iron, coal, lead, and precious metals. With railroads, ports, natural resources, fertile soil, a fine climate, and an industrious people waiting for direction, it is not hazardous to predict that the century will see wonderful changes in Manchuria.

See HARBIN; RUSSO-JAPANESE WAR.

Mandamus, man-dā'mus (from the Latin, meaning we command), a writ issued by a superior court ordering a lower court, or an official, to perform some duty; or else a writ ordering an appearance in court to show reason, if any, why a peremptory mandamus should not be issued. It sometimes happens through neglect, stubbornness, a spirit of evasion, or a worse motive, that delay occurs in the performance of a plain public duty. In case this is made evident to the court, a writ of mandamus may be issued. An injunction is a similar writ or order forbidding an individual to perform some contemplated act. Where ordinary process of law is too slow to prevent the doing of injury, a court may, at its discretion, issue an order to restrain. Both the mandamus and the injunction are issued by the same court. Neither is permissible when ordinary procedure at law is practicable.

A court may issue a mandamus compelling a sheriff to return a ledger seized without legal authority; or a register of deeds to record a deed. An injunction may be issued, as in a time of rioting, forbidding any person to delay a train carrying United States mail, to tear out a mill dam, or to lay a railway in a public street. The mandamus is issued to an officer ordering some particular act to be done. The injunction is served on a private person or corporation commanding that some particular act be not done. The former is designed to remedy a past grievance. The latter to prevent future damage. The one commands an official to do what he ought to have done before; the other orders a person not to do something he ought not to do. In case of disobeying either, the offender may be arrested and brought before the judge for contempt of court.

Mandan, an Indian tribe of the large Siouan family; the last remnants of the tribe are now on the Fort Berthold Reservation, situated at the confluence of the Little Missouri and Missouri rivers, North Dakota. The Mandan differed from their neighbors in the valley of the Missouri in that they were primarily agricultural, that they tattooed, and that they built a circular boat of buffalo hides on a willow frame.

The Mandan were once a flourishing, vigorous, influential tribe, but they suffered greatly from the attacks of other Sioux tribes, and were gradually pushed up the Missouri. But the greatest catastrophe in their history befell them in 1837,

when their numbers were reduced to less than 200 by an epidemic of smallpox.

They cultivated corn, tobacco, sunflowers and beans, and also hunted the buffalo. Usually they lived in palisaded villages of low log houses made tight with mud. Almost all white men who came in contact with the Mandan were impressed by their intelligence and friendliness.

Mandarin, the name applied by English speaking people, before the establishment of the republic, to any Chinese civil or military official. The name is not Chinese and is never used by them, their own name for the official class being "Kwan." There are nine ranks among the mandarins and each class is distinguished by the color of a button or ball worn on the cap, by a device on the breast of the coat and by the clasp of the girdle. The emblem on the coat of a civil officer was of a bird; that on the coat of a military officer, of some animal.

A mandarin was never permitted to hold office in his native province; he was not allowed to hold land or marry in the province to which his duties called him; nor could he have a close relative holding office under him. The mandarin wore an official robe, and the mandarin language was the language of the court.

Mandeville, Sir John, the alleged author of a book of travels. It was formerly believed to have been a record of the actual experiences of a man bearing this name, and much importance attached to Mandeville as the father of English prose. Later research has shown conclusively that the one who translated the work from the French was not the person who wrote the original. Although doubt still exists as to the identity of the compiler, it is now commonly acknowledged that the *Travels* consists of gleanings from various sources — legends, travels, romances, etc. It is believed that they record very few of the personal experiences of the compiler. According to information obtained from the prologue and epilogue, he was a knight who, in 1322, started on a journey to foreign countries, and was forced to return because of the gout.

The stories as told in Mandeville's *Travels* are full of the marvelous. He describes the Holy Sepulchre and gives many a legend of the monks. He describes the Garden of Eden, feeling that a traveler of repute ought not to omit so important a topic; yet protects himself by giving the credit to hearsay. Aside from topics clearly treated to find favor with the clergy, especially the pope, whose permission to publish was requisite, his observations have been confirmed by later travelers.

Mandingo, or **Mandenga,** a group of Negroes in Western Africa who occupy the region from Senegal and the Upper Niger to Monrovia, on the coast of Liberia. They number several millions and are divided into tribes, each having its own dialect. They are a spare, athletic people, with features distinct from those of other Negroes. They dwell in houses, and their food and dress are those of civilized nations. They accepted Mohammedanism centuries ago.

Mandolin, a musical stringed instrument of the same class as the lute. The body of the instrument is of narrow strips of wood bent and glued together into a hollow shell. On the open portion is fixed a sounding board. The neck is like that of the guitar. The Turkish mandolin has seven, the Spanish six, and the Neapolitan four, double strings. The latter is the one in most common use. It is played by a plectrum held in the right hand, while the fingers of the left hand regulate the notes as in violin playing. Its compass is about three octaves.

Mandrake, the popular name for several plants native to south and east Europe, western Asia, and also found in America and Britain. It has large taproots, white bell-shaped flowers, a fruit of the berry type containing many kidney-shaped seeds. The root occasionally resembles the human figure and the superstitious formerly believed it would shriek when torn up. It possesses narcotic qualities and is used in medicine. In the United States the May-apple is sometimes called mandrake. This latter perennial bears usually two umbrella-shaped leaves with a creamy odorous flower or two in the axil. Later is developed a sickish yellow fruit said to be "relished by pigs and boys."

Mandrill, a species of baboon, inhabiting western Africa where they associate in large numbers. The mandrill's peculiar physical characteristics are an ugly head with an orange-yellow beard, and topped by a bunch of black hair, a short tail, cheek-swellings striped brilliantly with red and blue, and a nose tipped with scarlet. Full-grown males measure about five feet and are exceedingly strong and fierce.

Manes, mā′nēz, in Roman mythology, the souls of the departed. The good spirits were called *lares,* and the evil *lavae.* They were worshiped as gods. The letters, D. M. S., sometimes found in sepulchers, stand for *Dis Manibus Sacrum* "sacred to the divine manes." Although regarded as infernal deities, the manes were believed to visit the upper air as ghosts occasionally. They were especially likely to do so on the 30th day of August, the 4th of October, and the 7th of November. These days the Romans regarded, therefore, as unlucky. No enterprise of importance was begun on these days. See ANCESTOR WORSHIP; MYTHOLOGY; LARES.

Manganese, an important metal, but one not popularly known. It looks like cast iron, and is likewise brittle and hard. The weight is a little greater than that of iron, being eight times that of water. It is distributed widely, and is associated with clays, iron, silver, and zinc ores. Generally speaking, manganese may be obtained in any metal-producing region, though Russia produces about half of the world's supply. It is an important element in the formation of steel. Many iron ores depend for their excellency on the presence of manganese, which is retained carefully. Manganese steel has ten times the strength of cast iron. In fact, nine-tenths of the product of the manganese mines is used in forming iron and steel alloys. All commercial iron contains manganese. It is a famous metallic dye. It is used to give clay door knobs a true jet, and also to give glass and pottery shades of violet, purple, green, brown, and black, varying according to quantity and degree of heat. It is also used to correct the green color noted in cheap glass. Considerable quantities are used in bleaching, in the making of disinfectants, as a drier of varnishes, and in printing calico. Manganese is also found as a constituent of plant and animal cells. See IRON.

Mange, mānj, the scab or itch in cattle, dogs, sheep or other beasts, caused by a small mite burrowing under the skin. The disease is contagious. The most successful treatment is by dipping the animal in solutions of tobacco and sulphur, lime and sulphur, or carbolic acid. Preparations containing poisonous materials should not be used. In regions where the disease is prevalent, farmers combine and construct small tanks to contain the solution and into this the animals are plunged.

Mangel, or **Mangel-Wurzel.** See BEET.

Mangle. See LAUNDRY.

Mango, a tropical fruit eaten from the hand or sliced and served like tomatoes. The fruit is four to five inches long. It has a smooth, soft, yellow or red skin, and a single seed almost as long as the fruit. The mango is a favorite fruit at Bombay. Beginners say a common mango "tastes like a ball of cotton soaked in turpentine and molasses." Partisans of the fruit claim that the "custard-like pulp combines the fragrance of the apricot and the pineapple." Though the mango tree is an Asiatic species, it is cultivated extensively in the West Indies. It was a promising fruit tree in Florida prior to the hard winter of 1885-6. Botanically, the mango tree is related to the sumac. The fruit is a pulpy, juicy drupe. The bark and leaves are rich in tannin.

Mangrove, an overhanging plant of tropical coasts, remarkable for the way it encroaches upon the sea. The seeds sprout before they fall, and are provided with roots half a foot long before they strike the muddy shore. Horizontal branches also send down aerial roots, possibly ten feet long, which take root and thicken above into trunks quite banyan-tree fashion. This process continues until a mangrove swamp is an impenetrable jungle growing far out into the sea, where it catches debris and silt and extends the coastline outward. Mangrove swamps are the refuge of fish, fowl, and beast. The mangrove abounds on tropical shores in both hemispheres. Mangrove swamps skirt Florida, occur at the mouth

of the Mississippi, and are seen along the coast as far as Texas. Shellfish cling to the stems and branches. Early navigators, sailing by when the tide was out, declared they had seen oysters growing on trees. The wood serves as fuel. The stems make serviceable piles. The timber is susceptible of a beautiful polish. The bark is used in medicine and in tanning.

Manhattan. See New York City.

Manila, the capital city of the Philippine Islands. It is situated in latitude 14° 35′ N.; longitude 120° 58′ E. It lies on both sides of the Pasig River which flows westward. The city has a frontage of four miles on Manila Bay on the west coast of Luzon. The police district of the city includes about thirty-two square miles. Manila proper is a walled town on the left or south bank of the river. This walled town was the old Spanish capital. The Spaniards resided here. A moat runs from the river around the foot of the wall to the river again. Water from the river enters the moat at the upper or east end, and flows around the wall into the river again. Up to 1852 the drawbridges were raised and the gates were closed at nightfall for fear of the native attacks.

The area within the wall is divided into fifty-six blocks by streets running at right angles to each other. The buildings are of two stories built in Spanish fashion. The most important of the Spanish structures are a cathedral, various convents and monasteries, schools, the University of St. Thomas, the hospital, and the palace. The last named was the residence of the Spanish governor and contained the government offices. A lofty monument to Magellan stands in a square facing the river. The Bridge of Spain, a modern stone affair of several arches, spans the river; this and three other bridges afford access to the section known as Binondo on the opposite or northern bank.

Chinese shops line the Rosario. The wholesale warehouses front the north bank of the Pasig between the Bridge of Spain and the bay. Vessels coming in from the ocean are guided by lighthouses to and through the entrance, which is twelve miles in length. The bay or harbor is 120 miles in circumference, and is large enough to shelter the navies of the world. In 1907 there were 223,542 inhabitants, a growth of 6,000 a year during the previous four years. Population, 1921, 285,306.

The city was incorporated by the American government in 1901. The management rests in a board of three members appointed by the governor with the advice of the Philippine commissioners. Thirty per cent of the expenses are paid by the central government; seventy by local taxation. The task before the Americans and the progress made were described by Dr. Heiser, chief quarantine officer.

There was no sewer system in Manila, with only the conduit method of disposing of waste of all kinds. In the city itself are thirty-one miles of canals which were nothing more than open filthy water courses into which all waste material was thrown. The water supply for the city came from a river along the banks of which 10,000 people lived and daily polluted its waters. Four thousand lepers roamed at will, and the insane were chained to stakes with dog chains. Cholera, when it became epidemic, would carry off hundreds of people, depopulating whole villages at times.

Today dozens of artesian wells exist, and in many localities the death rate dropped as much as twenty per thousand after the use of this water. A new gravity water system which brings water from an uninhabited water shed was completed in July, the old water shed having been patrolled by United States troops to prevent its pollution. The canals have been dredged and cleaned of the filth of centuries. A new sewer system for Manila, constructed at a cost of about $2,000,000, has improved the city's health. A modern ice plant produces daily 100,000 pounds of ice and 5,000 gallons of distilled water, which is sold by the government at a nominal charge. A leper colony has been established and all but 1,000 of the estimated 4,000 lepers have been brought there. The free distribution of quinine has greatly reduced the amount of malaria; diseases like beri-beri have almost been eliminated, and cholera is so well under control that only dozens die now where hundreds died before. And what is more important, the disease can be eradicated from a province in a few weeks. The discovery and active treatment of one cause of a high death rate, that due to intestinal parasites, has brought about an astonishing drop in the death rate.

Manila, a commercial fibre obtained from the stalk of the wild plantain of the Philippine Islands. This plant is related to the banana family. It is called Manila hemp, but the term hemp is, of course, a misnomer arising from the use to which the plantain fiber is put. The manila plan-

tain has been introduced into India, Borneo, and Japan, but the supply of fiber for the trade is still derived entirely from Manila, whence the name. In growth, the stems of the leaves sheathe or overlap, forming a sort of trunk. When the plant is three or four years old it is cut off near the ground. The blades of the leaves are cut away, and the sheathing trunk of the leaf stem is slit into strips. These are scraped by hand until the pulp has been removed, leaving tresses of tough fiber. It varies in color from a creamy white to a reddish tinge. The combed fibers are from six to twelve feet in length. The Filipinos weave the finest quality of fiber into a sort of cloth much worn by the natives. It is mixed frequently with cotton. The coarser qualities are washed, dried, sorted, and baled for export. Th United States buys about $15,000,000 worth of manila a year. It makes the strongest and most durable hard rope known. It is stronger even than hemp. A well made inch rope will sustain a quiet weight of 7,000 pounds. See SISAL.

Manioc. See TAPIOCA.

Manitoba, although it is one of the prairie provinces of Canada, and is thus considered a part of the great Canadian Northwest, is really about midway between the Atlantic and the Pacific oceans. It is also about equally distant from the Arctic Ocean and the Gulf of Mexico. Manitoba has an area of 251,852 square miles, of which 19,906 square miles are water surface. Previously to 1912, however, Manitoba had an area of only 73,752 square miles, comprising the present southern panhandle adjacent to the United States border. Manitoba, is now about three times the size of Minnesota, its southern neighbor, and is larger than any state in the United States except Texas.

THE PEOPLE. Six months after Manitoba became a province of the Dominion in 1870 it had a total population of 12,228, of whom 600 were Christian Indians, 1,600 were whites, and the balance half-breeds. Half a century later, in 1921, the census gave the province a population of 610,-118, about fifty times the figure of fifty years earlier. Most of the early settlers were of English or Scotch descent, but in later years, especially after 1900, there was heavy immigration from central and southern Europe. There are still about 12,000 native Indians in the province, most of them on reservations in the Nelson and Selkirk districts. Persons of Scotch and English ancestry are still sufficiently numerous, however, to give the Presbyterian and the Anglicans the largest number of church members. These are followed by the Baptists, Roman Catholics, Methodists, Lutherans and Greek Catholics.

PHYSICAL FEATURES. The most striking feature of Manitoba's surface is the countless number of lakes and rivers. Except for its eastern part, which belongs to the Laurentian Plateau, the entire province is a part of the great interior North American plain. In prehistoric ages the entire surface was glaciated, and the south central portion is believed to have been covered by a great lake, now called Lake Agassiz. West of the Red River valley, which was once covered by this lake, the surface rises gradually toward the west, coming finally to a well-defined ridge, whose highest points are known as Duck and Riding mountains. Duck Mountain, 2,000 feet above sea level, is the highest point in Manitoba.

Lake Winnipeg, with an area of more than two thousand square miles, is a vast reservoir for almost the entire province. From the south it receives the Red River of the North, which is joined just before it flows into the lake by its chief tributary, the Assiniboine. At its northern end Lake Winnipeg receives from the west the Saskatchewan River, the greatest stream flowing eastward from the Rocky Mountains. Gathering together these waters, with those of many other smaller streams, Lake Winnipeg discharges the surplus northeastward through the Nelson River into Hudson Bay. North of the Nelson River the largest streams in order from the south are the Churchill, the Etawney and the Seal, all of which reach Hudson Bay at the smaller bay sheltered by Cape Churchill.

From north to south Manitoba is 770 miles long, almost as far as from Chicago to New Orleans. Necessarily there are dif-

ferences in climatic conditions over so long a stretch, yet taken as a whole Manitoba has a fairly uniform climate, chiefly because it lacks high mountains. The summers are short, but there is abundant sunlight and rainfall to mature crops. The winters are long and cold, often with temperatures of 40° or more below zero. The mean annual temperature for the province is about 33° F. The change from season to season is very rapid.

These climatic conditions restrict the plant life and agriculture of the province. In the prairie sections trees occur only in the river bottoms or along the shores of lakes, but west of Lake Winnipeg and also the country east of the Red River is covered with a growth of poplar and spruce interspersed in places with growths of pine and tamarack. The western forest areas also have elm, oak, maple and aspen or poplar. Fur-bearing animals were once plentiful in all sections of the province, but the farmer has driven them gradually northward. Along the Nelson and the Churchill are mink, muskrat, marten and beaver; moose, deer and caribou, especially the last, are still abundant, and there are countless game birds. The Red River valley and Lake Winnipeg are on the course of many migratory birds.

Although over 40 per cent of its population lives in cities and towns, Manitoba is still and probably always will be, primarily an agricultural section. Both soil and climate are suited to the raising of spring wheat, for which Manitoba has set a world standard. In 1915 this crop was 69,000,000 bushels, but the average annual crop is nearer 40,000,000 bushels. Fifty million or more bushels of oats and fifteen to eighteen million bushels of barley are average crops. Considerable attention is given to potatoes, and rye, flax, hay and clover are also worthy of mention. A branch of agriculture which is rapidly developing is dairying, whose products are valued at about $5,000,000 a year.

Other Industries. Manufactures are yet of secondary importance, and are related chiefly to agriculture (flour and agricultural implements lead), although railway repairs and lumber products are increasing in value. All timber is cut under government supervision, most of it in the spruce belt north of the prairie region. In the southwestern part of the province are a number of hilly forested areas, several of which have been set aside as reserves. The largest are Duck Mountain Reserve and the Riding Mountain Reserve. In all the Manitoba reserves include about 3,700 square miles. Fishing is commercially not of great importance, the yearly catch being worth about $1,000,000. Whitefish and pickerel, are taken in abundance. Mining, too, except for gypsum, is a minor industry. Iron ore occurs on the shores of Lake Winnipeg, and soft coal in the southwestern part of the province; gypsum, of which Manitoba produces a third of the Dominion's output, is found principally in the district between the north end of Lake Manitoba and Lake Winnipeg.

Government and Education. Manitoba was the first province in Canada to follow the example of the states of the Union in setting aside two sections of land in every township as a grant for the maintenance of public schools. The elementary schools are free and non-denominational, and attendance is compulsory. The minister of education, who is a member of the provincial cabinet, controls primary and secondary schools. At the head of the public school system is the University of Manitoba, which was established in 1877; it has affiliated with it the Manitoba Agricultural College and a number of denominational schools. The provincial government maintains normal schools at Winnipeg and Brandon.

The plan of the provincial government is like that of the other provinces. The executive power is vested in the lieutenant governor and the executive council of seven members, responsible to the provincial legislature and selected from their number. The legislature has a single chamber of 55 members. For local administration the province is divided into municipalities, corresponding to townships in the United States. Cities and towns may be incorporated by special act of the provincial assembly.

History. Manitoba derives its name from an Indian legend about the narrows of Lake Manitoba. There the wind, rushing between wooded shores, makes a peculiar sound, which the Indians said was the voice of their supreme god, their Manito. This spot they called Manito-Weban, the narrows of Manito, which the white settlers shortened to Manitoba. The first white man known to have penetrated southern Manitoba was Sieur de la Verandrye, the French explorer, who first followed the shore of Lake Winnipeg in 1733 and five years later built Fort Rouge, on the site of Winnipeg. Real settlers were few, most of the white men in the region being hunters and traders, many of whom took Indian wives. The first attempt at permanent settlement was made between 1811 and 1817 by the Earl of Selkirk. He induced numbers of Scotch peasants to settle in the Red River valley as farmers. For half a century this Red River settlement remained the only important one in Manitoba. Then in 1869 the territorial rights of the Hudson Bay Company were transferred to the newly organized Dominion government, and in the next year Manitoba became the fifth province of the Dominion. In the meantime the halfbreeds, led by Louis Riel, had rebelled against the Canadian government, which would, they feared, take away their privileges. Their rebellion collapsed almost overnight on the arrival of a British force led by General Wolseley. In 1881 the province was enlarged from an area of 13,500 square miles to 73,732 square miles, and in 1912 it was given its present boundaries.

Political Issues. Manitoba has always been a storm center. Its people belong to many races and different religions. The question of separate schools for Roman Catholic children was in politics for twenty years, until in 1890 all separate religious or parochial schools were abolished, and the present system of non-denominational schools founded. By a provincial act of 1896, however, religious instruction may be given in the schools after the hour of 3:30 p. m. The rapid economic development of the province has also kept in the forefront such problems as curbing the power of railroads and monopolistic corporations. In 1908 the province took over all telephone lines, and in 1910 passed a workmen's compensation act. In 1916 a stringent prohibition law was enacted and the ballot was given to women. These two reforms were in the nature of war measures, but their effect was permanent. After the war there was considerable public dissatisfaction with the old party standards and methods, with the result that in 1921 there was a new party in the field, the National Progressive or Farmers' party. One of their aims was to secure reductions in the tariff duties on manufactured goods.

Statistics. The following are the latest statistics available from official sources:

Population, 1921 census	610,118
Area, land and water, square miles.	251,852
Winnipeg	179,087
Brandon	15,397
St. Boniface	12,821
Portage la Prairie	6,766
Members in Dominion Senate	6
Members in Dominion House of Commons	15
Members in provincial assembly	55
Chief crops, average yearly yield	
Wheat	50,000,000
Oats	50,000,000
Barley	15,000,000
Potatoes	4,000,000
Horses, total number	450,000
Milch cows	250,000
Other Cattle	500,000
Sheep	150,000
Swine	300,000
Value of farm property	$500,000,000
Creamery butter, yearly production, pounds	8,000,000
Fisheries, value of annual catch	$1,500,000
Animal mineral production	$3,000,000
Miles of railway	4,500

Manitoulin Islands, a group of islands in Lake Huron, distant from the north shore between seven and eighteen miles. The water between the shore and the islands is called North Channel; the latter flows into Georgian Bay, which the islands separate from the lake proper. The largest of the group, Great Manitoulin, or Sacred Isle, is 90 miles long and varies from 5 to 30 in width. Little Manitoulin, or Cockburn Island, is almost circular but has a diameter of only 7 miles. One of the group, Drummond Isle, belongs to Michigan; it

is 24 miles long and from 2 to 12 wide. The entire group, however, is not exhausted by these three, for there are dozens of smaller islands and islets. All are ruggedly beautiful and the larger ones are covered with dense growths of pine, making them a favorite resort with Canadians and Americans. The resident population of the Manitoulins is about 2,000; of whom one-half are Indians of the Ojibway tribe.

Manitowoc, Wis., an industrial city and the county seat of Manitowoc County, is situated 75 miles north of Milwaukee at the point where the Manitowoc River flows into Lake Michigan. It is on several railroads, and with its fine harbor has water connection with all important lake ports. While the principal industries are aluminum goods making and ship building and ship repairing, there are manufactories of dairy products, glue, edge tools, cigars, agricultural implements and foundry products. It contains the County Insane Asylum, St. Felix Industrial and Reform School, a Polish Orphan Asylum and a public library. The population in 1920 was 17,563.

Mankato, Minn., the county seat of Blue Earth County, is situated at the confluence of the Minnesota and the Blue Earth rivers, 85 miles southwest of St. Paul. It is in an agricultural region and a region abounding in stone quarries. Near the city is Rapidan Dam, furnishing hydroelectric power for manufactories of traction engines, trip hammers, knit goods, shirts and overalls, paper boxes, and foundry and machine shop products. Near Mankato once stood a village of the Mankato tribe of Sioux Indians. In 1862, 38 Sioux Indians were convicted of murdering white settlers here, and were hanged. The city contains a state teachers' college, a Carnegie library, public and parish schools and several parks. The city has a commission form of government. Population, 1920, 12,469.

Mann, Horace (1796-1859), an American educator. He was born at Franklin, Massachusetts, May 4, 1796, and died at Yellow Springs, Ohio, August 2, 1859. Of his boyhood it is said, "It was the misfortune of his family that it belonged to the smallest district, had the poorest schoolhouse, and employed the cheapest teachers in a town which was itself small and poor." When thirteen years of age he lost his father. He was obliged to work his way through school and college. He was educated at Brown University, studied law, and was admitted to practice in 1823. He opened his first office at Dedham, and in 1833 removed to Boston. He served ten years in the state legislature, first as a representative, later as a senator. He was instrumental in the organization of the state lunatic asylum at Worcester. At his suggestion the legislature appointed a board of education to reorganize the common school system of the state. Mann was made secretary, a position which he held for twelve years. He held conventions, lectured, carried on an enormous correspondence, and conducted an educational periodical known as *The Common School Journal.* His annual reports are still referred to. The seventh, following a trip abroad, gave his observations on the common schools of Prussia. This report is responsible in a large degree for the exaggerated estimate in which the common schools of Germany are held; but it has been of untold service in stimulating Americans to improve the schools of this country. During his secretaryship he succeeded in the establishment of state normal schools in Massachusetts, the first institutions of the kind in the United States.

In 1848 Mann was elected to Congress to succeed John Quincy Adams. He endeavored to induce Congress to establish a national bureau of education, thus paving the way for future action. As a congressman he was opposed to slavery. He was almost violent in his condemnation of Daniel Webster for what he considered a surrender to southern views. In 1852 he became president of Antioch College at Yellow Springs, Ohio, a position which he held until his death.

SAYINGS

Truth is greater than us all.

Education is the great money-maker not by extortion, but by production.

Lost yesterday, somewhere between sunrise and sunset, two golden hours, each set with sixty diamond minutes. No reward is offered for they are gone forever.

Manna, in the drug trade, a white, sweetish, flaky gum collected from the stems of a sort of ash grown chiefly in Sicily. The Sicilians raise plantations of young ash for the purpose. The manna is obtained by making short incisions in the bark. The manna exudes and dries, after which it is removed with wooden knives and is dried in the sun for shipment. In medicine it is used as a laxative, especially for children. The manna of the Israelites is supposed to be a somewhat similar substance exuded in June and July from the stems of the tamarisk, a shrub growing abundantly in the peninsula of Sinai. It has the form of drops of honey, which, in the cool temperature of the early morning, may be gathered in a solid state. It is gathered in small quantities by the Arabs and sold to pilgrims.

Mannering, Mary (1876-), an English actress, was born in London and studied for the stage under Hermann Vezin. She made her debut in 1892 at Manchester in *Hero and Leander* under her own name, Florence Friend. In the same year she appeared on the stage in London, and made her New York debut in 1896 under her stage name. Miss Mannering first starred in the title role of *Janice Meredith,* presented at Buffalo, N. Y. Personal charm and a remarkably musical voice, combined with unusual dramatic ability, quickly made Miss Mannering a favorite with American audiences. After 1900 she played leading parts in *Trelawney of the Wells, The Walls of Jericho, A Man's World, The Garden of Allah, The Lady of Lyons, The Truants* and *The Stubbornness of Geraldine.*

Manning, Henry Edward (1808-1892), a celebrated cardinal of the Roman Catholic church, one of the most prominent figures in the church life of Victorian England. He was born at Totteridge, in Hertfordshire, and was educated at Harrow and at Balliol College, Oxford, where he was graduated in 1830. He was ordained in the Church of England in 1832. In 1833 he married, his wife dying four years later. After becoming influential in the Church of England, Cardinal Manning left that church in 1851, joining the Church of Rome. His advancement was extremely rapid. He founded the congregation of Oblates of Saint Charles Borromeo at Bayswater, London, in 1857. In 1865 he was created Archbishop of Westminster, and in 1875 was made cardinal. Through his defining Papal infallibility at the Vatican Council in 1870, Cardinal Manning gained world renown. He was an able statesman of the Church, a devout priest, and an untiring practical reformer. Cardinal Manning's reform work along temperance and educational lines was particularly beneficial. Among his published works are *The True Story of the Vatican Council, England and Christendom* and *Sin and Its Consequences.*

Man-of-War Bird. See FRIGATE BIRD.

Mansard Roof, a roof with an angle in the slope so made that the lower part of the roof is steeper. It was devised by Francis Mansard, a French architect of the seventeenth century. Mansard windows are placed in the lower part of the roof, giving an effect of an additional story in the roof. This style is out of favor.

Manse, măns, in Scottish affairs, the dwelling of the minister. The Presbyterian clergyman of the established church is entitled by law to a manse at the expense of certain landholders called heritors. They must build and keep it in good condition; the minister is required to make ordinary repairs at his own expense. The term has spread to other denominations and lands. Hawthorne adopted the term in his *Mosses from an Old Manse,* written while he was residing in the old parsonage or manse of Concord.

Mansfield, Richard (1857-1907), an actor who first appeared as a musician in Liverpool in 1877. Six years later he achieved his first marked success as Baron de Chevreul in a French romance at the Union Square theater, New York, and in 1886 starred in *Prince Karl.* He created such parts as *Beau Brummel, Dr. Jekyll and Mr. Hyde, Monsieur Beaucaire,* and was most successful in *Cyrano de Bergerac* and in Shakespearian roles. In later years he managed a company of his own.

Though born in Heligoland, Mansfield was known as an American actor and among them ranked with the foremost.

Mansfield, Ohio, an industrial city and the county seat of Richland Co., 79 miles southwest of Cleveland, is the converging point of the Pennsylvania, Erie and Baltimore & Ohio railroads. It is a distributing center for a fertile agricultural region, and is noted for its diverse manufactures, having over one hundred large and small industrial institutions producing sheet steel, agricultural implements, electrical household appliances, automobile tires, pumps, plumbers sanitary appliances and many other products. It is supplied with artesian water and natural gas.

Mansfield is the seat of the Ohio State Reformatory, and has modern schools and a Carnegie library. It was chosen by the National Child Health Council as the "typical city" of America in which to conduct a five year demonstration for the improvement of child health welfare. In 1920 it had a population of 27,824.

Manslaughter, the killing of a human being, without malice. At common law manslaughter has two interpretations: voluntary and involuntary. Voluntary manslaughter implies the taking of life intentionally in cases of sudden passion caused by provocation, which in a measure lessens the offense. This sudden anger may be caused by gross insult or other wrong. Involuntary manslaughter is where the slaying is not intentional, but arises out of the commission of some unlawful act, which comes below the grade of felony. So, a railroad engineer, motorman or other driver, is guilty of involuntary manslaughter if he causes the death of another human being.

In modern legal procedure, the offense has been extended to any form of homicide which is neither murder nor justifiable nor excusable. In the United States, manslaughter involving extreme cruelty or the use of dangerous weapons is punishable by imprisonment for a term which varies from 5 to 10 years. This is for manslaughter of the first degree, another offense being the administering of drugs to cause miscarriage. For lesser degrees, shorter terms of imprisonment or fines, or both, are provided.

Mantell, Robert Bruce (1854-), an American actor, was born at Irvine, Scotland. It was planned that he should study law; this plan was given up for a commercial career, but fate willed otherwise. In taking part in an amateur theatrical performance, Mantell showed such aptitude for the stage that he decided to make an actor of himself. He joined an English company in 1876 at Rochedale, Lancashire, as the sergeant in *Arrah-na-Pogue.* His next role of importance was Father Doolan, in *The Shaughran.* Mantell soon became a great favorite and starred in such plays as *Romany Rye, Fedora,* with Fanny Davenport, *Hamlet, Richard III, Othello, Macbeth, Romeo and Juliet, The Lady of Lyons, Richelieu* and *Corsican Brothers.*

Mantis, or **Praying Mantis,** măn'tĭs, an insect allied to the grasshopper and the cricket. It has a slender body with long, locust-like hind legs and oval wings. The front legs are stout and spiny, well fitted to seize and hold the insects on which it feeds. When at rest it has a curious habit of raising the front part of its body and holding its front legs up before its vicious face, as if in prayer. "Certainly they are pious-looking fellows," says Comstock, "with their front legs clasped together in front of their meek, alert faces, and it is no wonder that they are called praying mantis. But the only prayer that could ever enter the mind of a mantis would be that some unwary insect might come near enough for him to grab it with his hypocritical claws, and so get a meal." There are several species. The American mantis is found only in the Southern States, where it is called the rear-horse and mule-killer. In Europe it is known as the camel-cricket.

Manual Training, a general term applied to all the various phases of hand work, now a part of every school curriculum. Under this head comes all the stick laying, paper folding, pasting, bead stringing, cardboard cutting, and weaving of the lower grades, up through the whittling, basketry, clay modelling, carving and bookbinding of the higher, to the actual bench work with tools, furniture making, and machine shop practice of the industrial and technical schools. Sewing and cooking properly come under this head also.

In a more limited use of the term, manual training is often applied to wood work with tools only.

In its more elementary aspects it has been found in our schools for many years; but the wide inclusion of the shopwork phase is of comparatively recent development. Thirty years covers it. In 1880 St. Louis opened the first special manual training school; and two years later it found its way into the elementary schools of Boston. It is needless to say that great opposition was met with, many thinking that the schools could not afford to lessen the time spent on book study; but the movement has carried all before it and is as recognized a part of most curriculums as grammar. Among its distinct advantages may be mentioned: 1. The development of the motor side in the child, as well as the purely mental. 2. Its practical value as a foundation for earning a livelihood. 3. A first-hand acquaintanceship with materials of construction. 4. A connecting link between the school and the everyday affairs of life. 5. An appreciation of the dignity of labor. Manual training, as such, does not aim to teach trades nor is it meant to displace the work formerly done in the schools; it is intended to supplement it, to add an element hitherto lacking. Aside from its practical aspect, it has a distinct cultural element, leading to a more rounded and complete development than was possible by the ordinary subject matter of education.

Manure. See FERTILIZER.

Manuscripts, from the Latin, meaning "written by hand," writings of any kind, on any material, as distinguished from printed matter. Before the introduction of printing, all literature was contained in manuscripts, all existing ancient ones being written on parchment or on paper. The paper was made from papyrus, cotton, silk, and, early in the thirteenth century, linen. The earliest mention of quill pens is in the seventh century. The most common ink was the black, which is very old, in very early times being made from burned ivory, lamp-black or charcoal. Sometimes titles, initial letters, and first lines were beautifully illumined in red, blue, gold, silver, yellow, or green in exquisite tones. As to external form, manuscripts were divided into rolls or stitched volumes.

The very ancient writers were mostly freedmen or slaves, but in Rome often the professional copyists were women. As early as the third century the monks spent much time in the scriptorium or writing room, assisted by a dictator, corrector, and miniator who added the ornamental touches to capitals, etc. Before the eighth century punctuation marks rarely occur and in the very old works the words are not even separated, the division of words first becoming general in the ninth century.

The most ancient manuscripts are Egyptian. Next in point of age come the Latin. Also many Greek manuscripts have been found in Egyptian tombs, bearing the works of Homer, Plato, Demosthenes, and others. It was the custom in the middle ages to obliterate and erase writings on parchment in order to use the materials anew, but this custom ceased when paper came into more general use.

Maoris. See NEW ZEALAND.

Map, a picture or chart of a part of the earth's surface. The beginning of maps may be guessed at from the origin of the name. It is a Carthaginian word, meaning a napkin or signal cloth. It is but natural that a commercial people should be the first to feel the need of maps. It has been noticed that wandering tribes have much more ability in sketching maps than settled people. The Eskimos have furnished Arctic explorers with numerous helpful diagrams. The Sioux Indian is able to sketch a map in the sand with his toe, accurate as to direction and relative distance. The earliest mention of maps is found in the writings of the Egyptians. Wooden tablets, on which seas and highways were indicated, are mentioned as dating from the time of Rameses II about 1333 B. C. Other maps referred to are believed to have existed from the fact that maps and plans have been found among the old papyrus rolls. One papyrus sheet preserved in the museum of Turin has been identified as a map of a mining district in Nubia far to the south of Egypt. Others are recognized as the routes of conquering armies, etc. Picture maps were discovered by Layard in his excavations at Nineveh and Babylon.

As it is natural for an observer to suppose that he is at the center of the world, the earliest maps were circular. An acquaintance with the shores of the Mediterranean led the Greek geographers to construct oval maps to take that sea all in. Democritus, Eratosthenes, Strabo, Hipparchus, and Ptolemy are names that appear in the history of Grecian map-making. They developed the idea of latitude and longitude as a guide. The Romans were famous for military roads. During the reign of Augustus a survey was made of the entire empire, showing the military roads in considerable detail. Maps were hung up on the walls of public buildings. Commanders were provided with maps for their guidance. The map-makers of the Middle Ages drew too largely on their imagination to have made valuable contributions. The Arabians, who, it should be remembered, extended their conquests from Spain to farther India, were map-makers of no mean order.

Modern map-making dates from the revival of learning which preceded the discovery of America. It began where Ptolemy left off. A special article may be consulted on MERCATOR. An edition of Ptolemy's geography, translated from the Greek into Latin, appeared at Rome in 1478. It was accompanied by a map of the world, ten maps of Europe, four of Africa, and twelve of Asia. The earliest printed map known is of Germany and western Europe, printed from wood, in 1460, and now in the national library at Paris.

The making of modern maps is a business of great magnitude. Houses of repute retain a staff of scholars whose business it is to keep the maps up to date. The preparation of a new map is a work requiring no little skill and patience. In addition to political maps, we have maps representing surface, those representing population, those representing industries, transportation routes, and various other facts. Maps are in newspapers, periodicals and in advertising circulars as well as in atlases and works on geography and history.

See PTOLEMY; GLOBE; GEOGRAPHY.

Maple, a genus including about fifty shrubs and trees of temperate North America and north India. Maples have fragrant, inconspicuous flowers and winged seeds. In falling, the seeds whirl to some distance from the parent tree, especially if there be a breeze. Maple woods are satiny in appearance and differ greatly in hardness. The wood of the hard, rock, curly, or sugar maple is exceedingly dense and hard. A cord of dry hard maple weighs over two tons. Bird's-eye maple is simply hard maple with a wavy grain. It takes a beautiful finish and is in demand for chamber furniture, desks, cabinets, and tables. Unless some other is specified, maple refers to the species of eastern North America from which maple sugar is made. Maple trees are tapped when snow is going off by boring or cutting into the cambium layer. The sap "runs" freely and is conveyed by short spouts or "spiles" into buckets or troughs placed for the purpose. The sap is collected twice a day or as often as may be required, and is boiled down in kettles hung on poles over fires or in vats placed on furnaces. When the sap has been reduced sufficiently by evaporation it is maple syrup. With a little more boiling, and if kept at the right temperature, with constant stirring, the syrup turns into granulated maple sugar. For an account of the pleasures of "sugaring off," read Charles Dudley Warner's *Being a Boy.*

Four gallons of sap should make a pound of sugar. A favorable season should yield from two to eight pounds per tree, dependent on the length of time the sap runs and the kind of weather. A continuation of frosty nights and bright warm mornings makes a successful season. Vermont is the banner maple state, though the maple sugar district extends from Maine westward on both sides of the Great Lakes to Minnesota and far southward in the mountains. The annual maple production is estimated at 2,000,000 gallons of syrup and 12,000,000 pounds of sugar.

The flow of sap before the frozen ground permits the drawing of moisture through the roots, and before sap has begun its natural flow to the leaves, is to be explained by the action of the sun in expanding the liquids of the tree. A warm bright morning thaws and expands the sap that has

stood in the tree over winter. It drips out through the incision. A chill breeze or a cool night reduces the pressure of the sap and stops the flow instantly. Maple groves have little underbrush. "The sugar maple is remarkable for a clean ankle," says Thoreau. See ADULTERATION.

Maple Leaf, The, the national song of Canada, celebrates the Canadian emblem, the leaf of the red maple. Though sung by Canadians as their national song, it is really an empire song, as the words that follow indicate:

In days of yore, the hero Wolfe,
Britain's glory did maintain,
And planted firm Britannia's flag
On Canada's fair domain.
Here may it wave, our boast, our pride,
And join'd in love together,
The Thistle, Shamrock, Rose entwine
The Maple Leaf forever.
Chorus.
The Maple Leaf, our emblem dear,
The Maple Leaf forever!
God save our King, and heaven bless
The Maple Leaf forever.

On many hard-fought battle fields
Our brave fathers, side by side,
For freedom, homes and loved ones dear,
Firmly stood and nobly died:
And those dear rights which they maintained,
We swear to yield them never,
We'll rally round the Union Jack,
The Maple Leaf forever!
Chorus.

In Autumn time our emblem dear
Dons its tints of crimson hue;
Our blood would dye a deeper red,
Shed, dear Canada, for you!
Ere sacred rights our fathers won
To foemen we deliver,
We'll fighting die—our battle cry,
"The Maple Leaf forever."
Chorus.

God bless our loved Canadian homes,
Our Dominion's vast domain:
May plenty ever be our lot,
And peace hold an endless reign;
Our Union, bound by ties of love,
That discord cannot sever,
And flourish green o'er Freedom's home,
The Maple Leaf forever!
Chorus.

On Merry England's far-famed land,
May kind heaven sweetly smile;
God bless old Scotland evermore,
And Ireland's emerald isle!
Then swell the song, both loud and long,
Till rocks and forest quiver;
God save our King and heaven bless
The Maple Leaf forever!
Chorus.

Marat mä-rä′, **Jean Paul** (1743-1793), a leader of the French Revolution, was born at Neuchatel, Switzerland. In youth he imbided the doctrines of Rousseau and studied and practiced medicine in Bordeaux and Paris, where he became a specialist on eye diseases. He was granted a degree by the University of St. Andrews. Hearing of his fame as an able physician, the Comte de′ Artois, later known as Charles X of France, summoned him to Paris at a liberal salary.

Despite his position at court, he was very broad in his views, and strongly opposed aristocracy. In the days of the Revolution, he was one of the most outspoken in favor of the change, and became one of the leaders of the movement. In a paper published by him called *The People's Friend*, he attacked the city authorities and the King, and soon became the oracle of the Paris mob, while the authorities were always on his trail.

Marat became one of the twenty-four representatives of Paris in the National Assembly, and he promoted the insurrection of August 10th, the Prison Massacres, and the establishment of Terror. On July 13th, 1793 he was stabbed to death by a young girl named Charlotte Corday in his home.

The assassination of the French rebel caused a tremendous amount of upheaval in Paris. The people acclaimed him the "martyr of the people"; poems were written immortalizing his deeds; painters and sculptors produced pictures of him, and all of France mourned. It was in November of the year of his death that the Convention voted to bury Marat in the famous Pantheon. See CORDAY, CHARLOTTE.

Marathon, a plain on the eastern coast of Attica. It is a short day's journey from Athens. It is famous for a victory won by the Athenians over the Persian army of Darius, 490 B. C. The Persians landed here to the number of 100,000 men, with the avowed purpose of leveling the walls of Athens and of putting its inhabitants to the sword or selling them into slavery. The Athenians sent swift runners to Platea and Sparta. The messenger ran the distance to Sparta, 140 miles. in 36 hours, only to be told that the Spartan army could not set

out before the full of the moon yet a week off. The sincerity of the reply is doubted. The Plataeans, however, sent their full force, 1,000 hoplites. Each of the ten tribes of Athens contributed 1,000 men. Ten Athenian commanders were entitled to command a day each in regular succession. They placed their small army under Miltiades, who, however, waited for his regular day, before he offered battle. He drew up his army in a long line and ordered a charge down a gentle slope upon the host of the Persians. The Greeks wore heavy bronze armor and were armed with long spears. They charged in platoons. The light-armed Persians, dressed in linen tunics, were no match for them. The Greeks plowed through the Persian ranks again and again. Sixty-four hundred Persians were slain before the mighty host fled to their ships. One hundred sixty-two Athenians who fell in battle were accorded the honor of burial on the plain of Marathon. A great mound of earth was raised above them where it may yet be seen. Ten marble pillars surmounting the mound, one for each tribe, were inscribed with the names of those who fell for their country. The battle not only saved Athens, but gave the Greeks a feeling of confidence in their superiority over the Persians, then the great world power. It paved the way for Greek supremacy. Browning's poem, *Phidippides* gives a thrilling description of the swift runner sent to Sparta for aid and his repulsion by the Spartans.

The mountains look on Marathon
And Marathon looks on the sea. . . .

The flying Mede, his shaftless broken bow;
The fiery Greek, his red pursuing spear,
Mountains above, Earth's, Ocean's plain below,
Death in the front, Destruction in the rear,
Such was the scene.

—Byron, *Childe Harold.*

Marble, a limestone that has become close grained under the influence of heat and pressure. It is simply a coarse-grained limestone susceptible of receiving a polish. The most celebrated marble in the world is that of Mount Pentelicus in Attica, Greece. The Parian marble quarried in the Isle of Paros was much used by sculptors. The marble best known to the modern artist is that from the quarries of Carrara, Italy. There are excellent marbles in England, the Hebrides, and Algeria, and also in Mexico and eastern Canada. The Rocky Mountain region abounds in ledges of marble that must some day prove very valuable. California has deposits. The marble of Georgia is much used for capitol buildings. Tennessee marble was used extensively for the capitols at Albany and Washington. The famous mausoleum, known as the Taj Mahal, at Agra, India, is built of beautiful marble. The chief seat of the marble industry in the United States is located, however, in the northeastern part. The quarries of Pennsylvania, New York, and especially Vermont, are celebrated. More marble is quarried at Rutland in the last named state than at any other place in the world. Instead of drills and explosives, involving tedious expense and waste of material, channels are cut in the marble ledges by steam power. A ledge is bored and scored like an ice pond. A gang of chisels held in a frame cuts a groove in the ledge, releasing huge blocks of any desired size. Powerful steam cranes remove these blocks from the quarry and place them in position where they may be cut by toothless steam saws into any desired shape or size. The marble output of the United States in 1920 was valued at $4,397,912.

Marble differs greatly in color, varying from a pure, snowy white to marble that is positively black in color. Parian marble has a waxy appearance when polished. Carrara marble is of a glistening whiteness. Colored marble is made so from an oxide or other impurities. The colored marbles most used are the *rosso-antico* of a blood-red color; *verde antico,* which is green; and *giallo antico,* which is yellow with black or yellow rings. *Nero antico* is black. Colored marbles were used by the ancients for statuary and for the pillars used in the construction of houses.

White marble is a sort of limestone which has not only become changed in texture by heat and pressure, but it has lost its color. The finest white statuary marble is worth from fifteen to twenty dollars per cubic foot.

See CARRARA; SCULPTURE; STUCCO; LIMESTONE.

Marble Faun, The, a novel by Nathaniel Hawthorne, published simultaneously

in Boston and London in 1860. The London publishers gave it the title of *Transformation.* The scene is laid in Rome. The principal characters are Kenyon, an American sculptor, Hilda and Miriam, two art students, and Donatello, a young Tuscan count. Donatello's resemblance to the statue of the Marble Faun by Praxiteles gives the title to the book. According to rumor, he is a descendant of an ancient faun; in the opening of the story he is represented as possessed of the simple, joyous, irresponsible nature which might belong to such a creature. He falls in love with Miriam, an artist, and for her sake impulsively commits a murder. The remorse for his crime and his passion for Miriam awaken him to a sense of responsibility and the higher destiny of man.

Marbles, a well known game for boys. The name is due possibly to the fact that the first marbles were made out of the stone known as marble. Some marbles are made of potter's clay. They are glazed and baked in an oven, like earthenware. One pottery in Ohio makes nothing else; 100,000 marbles are made daily. China marbles are made of porcelain clay. Glass marbles are formed usually by pressing molten glass into iron molds, or by gathering a small globule of molten glass on the end of a short rod and whirling it until it cools. Sometimes a china figure is affixed to the end of the rod before dipping into the molten glass. In this way the marble may be made to inclose any desired figure.

The marbles known as agates are made chiefly at a town called Oberstein in Germany where labor is cheap. The workmen break the stone into small pieces and chip it nearly round with a hammer. They complete the process by grinding on an emery wheel and polishing. Such marbles are necessarily expensive.

The world's supply of stone marbles comes chiefly from Germany. The workmen break the stone into cubes. A hundred of these are placed on a millstone, the surface of which is provided with a number of grooves. A second millstone of hard oak wood is let down upon the face. By causing these stones to whirl rapidly, the cubes are rolled and rounded and polished quickly into marbles. A current of water, fed through the center of the wooden mill, carries away the dust as fast as it is ground off. It also cools the mill and prevents undue heating.

In *Our Hundred Days in Europe,* Holmes, describing his visit to Westminster Abbey, says:

> Amidst all the imposing recollections of the ancient edifice, one impressed me in the inverse ratio of its importance. The Archdeacon pointed out the little holes in the stones, in one place, where the boys of the choir used to play marbles, before America was discovered—centuries before, it may be. It is a strangely impressive glimpse of a living past, like the *graffiti* of Pompeii.

March, the third month of the year. It was originally the first month of the Roman year, and was named in honor of Mars, the god of war. Astronomically, it is the first month of spring. In northern latitudes, however, it is a winter month. In southern Australia, it is, of course, the last month of summer, corresponding to our September. The Anglo-Saxons called it the loud or stormy month. The farmers of England desire a dry March for the sake of their crops. There is a popular proverb that "A bushel of March dust is worth a king's ransom." To people impatient for spring, it seems the longest month in the year. The Scotch have a tradition to the effect that March borrowed its last three days from April in order to prolong winter weather. These borrowing days, as they are called, are considered ill days. They are described in a countryside rhyme as follows:

> The first, it sall be wind and weet,
> The next, it sall be snow and sleet;
> The third, it sall be sic a freeze,
> Sall gar the birds stick to the trees.

Marco Polo. See POLO.

Marconi, Guglielmo, goo-lē-ĕl-mō mär-kō′-nē (1873-), an Italian engineer and electrical inventor. He was born near Bologna, Italy. He was educated at the universities of Bologna and Padua. While a student he took a deep interest in electricity, and early occupied himself in devising apparatus for sending electrical messages without direct conductors. He interested the English government in apparatus for sending wireless telegrams. In 1899 he succeeded in sending messages across the French Channel from Boulogne

to the English coast, a distance of over thirty miles. In the same year he visited the United States exhibiting his apparatus. In 1901 he set up apparatus at St. John's, Newfoundland, and succeeded in exchanging wireless messages with a station in England. The Anglo-American Cable Company, which had been granted a telegraphic monopoly of the service between Newfoundland and England, required Marconi to abandon his Newfoundland station. He set up his instruments at Table Head on Cape Breton Island and completed his experiments successfully. While Marconi cannot be said to have invented wireless telegraphy, he has the honor of having made it a practical success. Although the method has not yet supplanted the use of ocean cables, it has been adopted widely for use in conveying messages between the land and ships at sea. Transatlantic ships with suitable apparatus may now be said to be in telegraphic communication with the mainland during the entire voyage. The details of wireless telegraphy are too technical for description here. See TELEGRAPHY.

Marcus Aurelius Antoninus (121-180 A. D.), a Roman emperor. He was one of the ablest and most humane of the Roman emperors. Several severe contests were waged during his reign both with foreign and domestic foes, but cruelty, deceit, and inhumanity, so characteristic of many Roman emperors, do not appear to have stained his record. During his reign an army returning from Asia Minor and the East brought home an Asiatic plague. It is said that one-half of the population between the Euphrates and the Atlantic was swept away. The subsequent decay of the Roman Empire is attributed in part to the pestilence. Marcus Aurelius, as he is usually called, was a genuine heathen, carefully instructed in the doctrines of the Stoics. Though unfavorable to the Christians, whom he persecuted, he left behind a volume of *Thoughts* which breathe a lofty spirit, approaching at times the teaching of Christ Himself.

Love men; revere the gods.

A man should *be* upright, not be *kept* upright.

All that is from the gods is full of providence.

All is ephemeral,—fame and the famous as well.

What is not good for the swarm is not good for the bee.

As emperor I am a Roman, but as a man my city is the world.

That which comes after ever conforms to that which has gone before.

Love the little trade which thou hast learned, and be content therewith.

The best way to avenge thyself is not to become like the wrong doer.

Let not thy mind run on what thou lackest as much as on what thou hast already.

From my mother I learned piety, and abstinence not only from evil deeds, but from evil thoughts.

A wrong-doer is often a man that has left something undone, not always he that has done something.

In the morning, when thou art sluggish at rousing thee, let this thought be present; "I am rising to a man's work."

Nothing has such power to broaden the mind as the ability to investigate systematically and truly all that comes under thy observation in life.

Just as the sand-dunes, heaped one upon another, hide each the first, so in life the former deeds are quickly hidden by those that follow after.

Suppose that men curse thee, or kill thee, . . if a man stand by a pure spring and curse it, the spring does not cease to send up wholesome water.

If thou workest at that which is before thee, following right reason seriously, vigorously, calmly, without allowing anything else to distract thee, but keeping thy divine part pure, as if thou shouldest be bound to give it back immediately; if thou holdest to this, expecting nothing, fearing nothing, but satisfied with thy present activity according to nature, and with heroic truth in every word and sound which thou utterest, thou wilt live happy. And there is no man who is able to prevent this.

Mardi Gras, mär'de grä', Shrove Tuesday. The term is French, meaning "Fat Tuesday." It is so called from the French custom of leading a fat ox in a procession in celebration of the day. It is the last day of carnival, being the day before Ash Wednesday, the first day of Lent. In New Orleans, Mardi Gras is the occasion of an annual procession, with festivities and revelry lasting until midnight. The festival draws many visitors to the city.

Mare Island, an island in San Pablo Bay, California, 28 miles north of San Francisco. It is important from the fact that it is the chief United States naval station on the Pacific Coast. There is a naval arsenal and also a dock-yard here. These include wet and dry docks, barracks, ordnance yards, repair shops and a hospital; also an observatory and a plant for the building of war vessels. The station is

properly known as the "San Francisco Navy Yard," and it is a port of departure for troops and materials destined for the Philippines.

Marengo, a village in the north of Italy, near the Bormida, 3 miles southeast of Alessandria. Here on June 14, 1800, Napoleon with an army of 33,000 French defeated 30,500 Austrians, commanded by Melas. The loss of the French was 7,000 in killed and wounded, that of the Austrians about 10,000. In this battle, Napoleon lost General Desaix, his friend, but he regained his prestige in France.

Margaret. The heroine of Goethe's *Faust*. See FAUST.

Margaret of Anjou (1430-1482), the queen of Henry VI of England. She was the daughter of René the Good, who laid claim to the throne of Naples. Henry was a man of weak mind. Margaret was practically king. Inasmuch as he was incapacitated to reign, a descendant of an older branch of the royal family laid claim to the throne, preciptating the Wars of the Roses. Warwick, the king maker, fought against her, then for her. She was defeated finally in the noted battle of Tewkesbury. She and her son were made prisoners. Her son was led into the presence of the victorious prince and butchered. Her husband was murdered soon after in the tower. Margaret was held a prisoner for four years and was then ransomed by the king of France.

Margaret of Norway. See FAIR MAID OF NORWAY.

Margaret (1045?-1093), queen of Scotland, known as St. Margaret. She belonged to the line of Saxon kings driven from the throne by William the Conquerer. She was a granddaughter of Edmund Ironsides. She fled with her brother Edgar to Scotland for protection, and later married Malcolm, the Scotish king. She was a woman of devout piety who consecrated her life to the improvement of the manners of the rude Scottish court, the education of her children, and the instruction of the people in religious matters. She was a noted needlewoman. She taught the women of her court embroidery and similar arts. Her daughter, Matilda, married Henry I, son of William the Conqueror, thus uniting the Saxon and Norman lines of English kings. She was canonized by the church in 1250.

Maria Theresa, ma-rĭa te-rē'sä (1717-1780), empress of Germany. She was the daughter of the Emperor Charles VI of Austria. By a royal decree of 1713, known in history as the Pragmatic Sanction, Charles arranged the order in which his heirs should succeed him. After prolonged negotiations he secured the assent of the nations to the provisions of the act. Maria Theresa's only brother died in 1724. She then became the next heir to the Austrian dominions. In 1736 she married Francis of Lorraine. At her father's death, in 1740, she was crowned ruler of Austria-Hungary and Bohemia. The Emperor chosen by the electors lived but a few years, when her husband was chosen emperor of Germany, with the name of Francis I. Her reign as queen was marked by the attacks of her neighbors and the loss of territory—Silesia to Frederick the Great of Prussia, and Parma and other Italian territory to Spain. A cousin laid claim to the throne, bringing on the War of the Austrian Succession, closed by the famous treaty of Aix-la-Chapelle in 1748. Later she engaged in a terrible struggle, known in Europe as the Seven Years' War, in America as the French and Indian War. She acquired territory at the expense of Turkey, however, and fell heir to a considerable portion of Poland at the first partition of that unfortunate country. The strongest supporters of the Queen were the Hungarian nobles to whom she restored many old time privileges.

The queen had sixteen children. One of her daughters was the ill-fated Marie Antoinette of France. By all accounts, Maria Theresa was a beautiful, high-minded, patriotic woman. She ruled her people wisely, encouraging agriculture and higher education. She was a strict Catholic and suppressed the Protestants. In spite of the cares of state, she brought up her children wisely and left them an unblemished reputation.

See FREDERICK II; POLAND; MARIE ANTOINETTE.

Marie Antoinette (1755-1793), queen of France. She was the daughter of

Francis I and the celebrated Maria Theresa. She was born at Vienna, November 2, 1755, and suffered death under the guillotine in the Place de la Concorde, Paris, on the morning of October 16, 1793. While a mere child she was married to the French dauphin, afterward Louis XVI. She came to maturity under the frivolous influence of the French court. She was handsome and well fitted to be the center of a brilliant drawing-room assembly, but she had no practical knowledge,—no thought for the needs of the French people. Though lovely and high spirited, she was ignorant, and, it would seem, selfish, not to say frivolous. In important matters of state she had no deeper sense of responsibility than to restrain her husband, the king, from needed steps by pouting and joining her influence to that of self-seeking courtiers who feared loss of personal privileges. Turgot and Necker, able finance ministers of the king, found her obstinate, set against concessions to the people, and opposed to their influence with the king. Her scale of expenditure led the financiers to dub her "Madame Deficit."

She consorted with the dissipated element of the court altogether too much and gave opportunity for unfounded reports to get abroad. The people of Paris believed her heartless and worse. Stories of her thoughtless extravagance in the midst of dire starvation reached the hungry women of Paris and made them hate her. While she was squandering the people's money on worthless jewelry their children were in tatters. When the Revolution came on she was believed to be in correspondence with the Austrians with a view to an invasion of France by foreign troops. She encouraged the king to flee from France, and was with him when he was arrested and brought back to Paris. Her execution was delayed nearly a year beyond that of the king.

Speaking of her when she came to Versailles, the bride of the young Louis, says Burke, "Surely never lightened on this orb, which she scarcely seemed to touch, a more delightful vision—full of life, and splendor and joy." Years later, her hair whitened with anguish, and her face seamed with sorrow, she rode in a common cart, but with dauntless bearing, to the place of execution. Screaming fishwives and market women, delirious with joy, ran by her side, and sent up a cheer when the merciless blade of the guillotine fell.

The apartments occupied by Marie Antoinette in the palace of Versailles are still known by her name. Her favorite walks in the great park and the cottage where the ladies of the court played at being peasants are still shown. Her life has been compared with that of Mary, Queen of Scots. Both were well born, high spirited, charming women; fate dealt harshly with both; but here the similarity ends. Marie had less responsibility, less opportunity, less knowledge. Her personal life was free from taint of vice.

Marigold, an old-fashioned, but attractive garden flower of the composite family. The marigold is a hardy, easily cultivated annual. Both "French" and "African" marigolds are of Mexican origin. They were introduced into England about 1573-96. The wild flowers were much improved by gardeners. Marigolds are noted for a strong odor. In some varieties the inner florets have been developed into straps, giving rise to "double" flowers. The straps have a velvety surface in rich reds, yellows, and browns. Marsh marigolds are early spring flowers belonging to an entirely different family—the buttercup.

Marietta, Ohio, the county seat of Washington County, is situated at the confluence of the Muskingum and Ohio rivers, 115 miles southeast of Columbus. Marietta is reputed to be the oldest settlement in the state. It is surrounded by a rich agricultural region and is in the oil fields of southeastern Ohio. Agricultural produce and crude oil are the principal articles of commerce. In the city are numerous factories, producing iron and steel, chairs, oil well supplies, bricks, refined petroleum, tables, harness, safes, silos, glass, paints, chemicals and machine shop products.

The city was founded in 1788 and was named for Marie Antoinette of France. The edcational system includes two libraries and Marietta College, besides the public schools. Several earthworks erected by the mound builders situated near the city are of historic value. In 1920 the population was 15,140.

Marines, mā-rēnz′ in the British and American navies, sea soldiers, bodies of infantry trained to accompany ship of war for the purpose of making a landing or performing such military service on shore as may require disciplined troops. Marines are commanded by their own officers and are not assigned permanently to any particular ship. The pay and discipline are similar to that of the infantry.

The United States Marine Corps is a separate branch of the naval service. It is at all times subject to the laws and regulations of the navy, except when detached for service with the army by order of the President; and when so detached it shall be subject to the laws and regulations of the army.

Marines were first established as a part of the British naval service in 1664 to act as an expeditionary force of sea soldiers in the fleets, which in those early days were raised and manned, not for the purpose of meeting the enemy at sea but with the specific object of transporting a force of military to land on the enemy's coast. In other words, the vessels of the fleet acted as transports. While the marine, by his higher discipline, was an example to the seaman and soldier, and while his ready obedience to orders served to make him valuable in the prevention and the suppression of mutinies, the true object of the marine force at its inception was not that of maintaining discipline and order amongst "the turbulent and refractory seamen of the period," but of serving as a military body adapted to naval conditions.

Their utility becoming conspicuous, their number was increased until at the date of the Battle of Trafalgar it was over 30,000. In 1740 three regiments of marines were raised in America and their duty was exclusively of an expeditionary nature. Down to 1804 the British marines were an infantry force. In that year they were divided into infantry and the royal marine artillery.

The United States marine corps is commanded by a major general called the major general commandant, with headquarters at Washington, D. C. The present commandant is Major General John A. Lejeune, who commanded the second division of regulars, including the famous Fourth Brigade of Marines, that fought throughout the World War in France. During the World War the corps was increased to 3,341 officers and 75,500 enlisted men, which is the maximum strength ever authorized. On June 4, 1920, Congress established the strength at 1,095 commissioned officers, 157 warrant officers and 27,400 enlisted men, which is the present authorized strength. Commissioned officers are appointed from graduates of the naval academy, worthy non-commissioned officers, and the highest type of civilians.

About five weeks after the outbreak of the World War approximately one-sixth of the marine corps sailed from the United States, forming one-fifth of the first expedition of American troops for service in France. During the World War about 32,000 marines were sent overseas; they fought in four major operations and four other distinct operations; two infantry brigades were stationed in France; two regiments and one machine gun battalion were awarded the French fourragere; 811 American and 1,789 foreign, a total of 2,600, decorations were awarded marines; marines served on sixty vessels of the navy, including those with the British Grand Fleet and other vessels in European waters; seven detachments served with the navy ashore in Europe; fifteen stations at least, not in Europe but beyond the continental limits of the United States, were garrisoned by marines; marines served as aviators in France and the Azores, with the army and navy. During the war marines served in America, Azores, Belgium, China, Cuba, Domingan Republic, England, France, Germany, Guam, Haiti, Hawaiian Islands, Ireland, Luxembourg, Nicaragua, Philippines, Porto Rico, Scotland, Virgin Islands and Wales, and in addition served as attaches and couriers in such countries as Denmark, England, France, Greece, Holland, Italy, Japan, Norway, Russia, Spain and Sweden. Corporal Mike Chockie, of the marines, fired the first shot of the World War at Guam on April 6, 1917.

At Belleau Wood, in the Chateau Thierry Sector, in June, 1918, the Fourth Brigade

of Marines covered itself with glory, by blocking "the German advance on Paris." The President of the United States said so and General Pershing reported likewise and moreover referred to the Battle of Belleau Wood as "the Gettysburg of the War." The historic spot where the marines turned the point of the German dagger is at Les Mares Ferme, the nearest point to Paris reached by the enemy in 1918. This victory galvanized allied morale. During the twenty-six days of constant fighting in Belleau Wood, 28 officers and 1,007 enlisted marines met death in battle and additional casualties were suffered amounting to approximately 3,608. It was that fighting and those 4,643 casualties that first made the name of Chateau-Thierry famous. It was not that these Americans had saved Paris, but that the sacrificial successes of an unknown quality—the American soldier—resuscitated the jaded spirit of the allies and vivified the will to win. As a result of this success, the allies, with reborn hope and faith in the Americans, met the subsequent German offensives with rejuvenated morale.

The achievements of the marines in the Chateau-Thierry Sector were twice recognized by the French—the name of Belleau Wood being changed by the French to *Bois de la Brigade de Marine* and the marine organizations were cited by the French. Prior to this fighting at Belleau Wood the marines had served a month in the front lines near Verdun.

After Belleau Wood the marines fought at Soissons, St. Mihiel Salient, Blanc Mont in the Champagne, and in the Meuse-Argonne offensive. They formed a part of the army which occupied Germany until August, 1919, when they returned home. Their battle casualties is the measure of their courage and devotion to duty—78 officers, 2,379 enlisted men, a total of 2,457 marines, met death in battle; 255 officers, 7,459 enlisted men, a total of 7,714 marines, were wounded or gassed without fatal results. The total battle casualties of the marines was thus 10,171, which does not include any deaths or accidents from causes other than battle. In all this fighting the marines fought as a unit of the second division of the army, which was commanded in turn by Brigadier-General Charles A. Doyen, Major Omar Bundy, James G. Harbord, and John A. Lejeune of the marines.

The marine brigade was commanded at various times by brigadier-generals Charles A. Doyen, James G. Harbord, John A. Lejeune and Wendell C. Neville.

Marion, Francis (1732-1795), an American soldier. He was a native of South Carolina, of Huguenot ancestry. When a lad he saw service in the West India trade. He also served in the campaign against the Cherokees. At the outbreak of the Revolutionary War he was a planter in the parish of St. Johns. He was a member of the South Carolina Assembly of 1775 that voted to raise troops and join the sister colonies. He was appointed captain of a local troop and took the field vigorously against the Tories of his state. He was an active participator in the defense of Charleston in 1776 and commanded a regiment during the unsuccessful attack on Savannah in 1779. The successful invasion of the state by the British drove Marion into the forests and swamps. He gathered a band of hardy fellows about him who knew the morasses and fords well. He carried on a partisan warfare. He would sally out and attack the British and then regain cover before they were sufficiently recovered from their astonishment to pursue him. Tarleton, the British commander of cavalry, whom Marion led many an unsuccessful chase, called him "The Swamp Fox." An excellent idea of the life led by Marion and his men may be had from Simm's Tales, particularly *The Partisan.* Marion was present at Eutaw Springs, and, as might be expected, was in the forefront of the battle. At the close of the war, notwithstanding the fact that he had burned many a Tory country residence, he favored a conciliatory policy. He served in the Senate of his state and was a member of the convention that formed a state constitution. He was a slight, active, wiry man, free from petty hatreds and prejudice. He was a favorite with his neighbors and is regarded as one of the heroic figures of the Revolutionary War. See SUMTER.

Marion, Indiana, the county seat of Grant County is on the Mississinewa River and on several railroads, 73 miles northeast of Indianapolis. Marion is important as a manufacturing city, among her products being railway supplies, motor trucks, flour, pulp and paper, insulated wire, heating stoves, ranges and electrical specialties. It is also a shipping point for the hay, corn, oats, wheat and live stock raised in the vicinity.

The city contains a Masonic Temple, a business college, public library, Marion College, Marion National Sanatorium for the late war soldiers, Association of Commerce, churches and modern public schools. The population in 1920 was 23,747.

Marion, Ohio, a manufacturing city and the county seat of Marion County, is 48 miles north of Columbus, on four railroads. It is in the center of a bountiful agricultural region, and the limestone quarries in the vicinity also add to the city's wealth. The most important single industry is the steam shovel industry, while other manufactures are pianos, silk, racing sulkies, dredges and agricultural implements. Marion was the home of President Harding.

The city has a Carnegie library, the Marion County Children's Home, an old ladies' home and a normal school. In 1920 the population was 27,891.

Mariposa Lilies, a beautiful genus of western plants corresponding in our flora to the tulips of the Old World. Mariposa tulip would be a better name. They are found throughout a wide reach of territory extending from Montana, Wyoming, and New Mexico to the Pacific coast, and from British Columbia to Mexico. The most easterly species is found in Nebraska. The typical mariposa takes its name from the valley of California. Like the Old World tulip they spring from coated corms. Some species are woodland flowers; some grow in meadows; others in the crevices of crumbled rock; and yet others give variety to arid deserts. The flowers are usually bell-shaped, erect, drooping or nodding. The coloring is exquisite. There are delicate tints, creamy whites, and rich reds, yellows, browns, purples, lilac, and lavender. These flowers are the delight of Western florists and collectors. See TULIP.

Marius, Caius. See SULLA.

Mark Twain. See CLEMENS.

Markham, Edwin (1852-), an American poet. He was born in Oregon City, Oregon. He was educated at Christian College, Santa Rosa, California. He studied law, but devoted himself to work in educational lines. He first won attention as a writer through the poem, *The Man With the Hoe,* published in the San Francisco *Examiner.* The poem was suggested by Millet's picture of the same name. After this poem had made him famous, Markham removed to Brooklyn, New York, and engaged in literary work. His writings in book form include *The Man With the Hoe and Other Poems, Lincoln and Other Poems,* and *Field Folk, Interpretations of Millet.* See MILLET.

Marl, a lime-enriched clay, or sand. Marl owes its peculiar character to the disintegration of innumerable shells of small mollusks. Marl is exceedingly mellow. It is used to dress lands lacking in fertility. It is used also in the making of Portland cement. The most noted American deposits are found on the Atlantic coast, but marl may be found at the bottom of ancient swamps, almost anywhere. Marl impregnated with phosphorus is known to the gardener as phosphate. Marls and phosphates are important articles of shipment from Savannah and other South Atlantic cities. The potato raiser of the Aroostook valley, Maine, drops a handful of phosphate in each hill. See LIME; PHOSPHORUS.

Marlboro, Mass, an industrial city, is on the Boston & Maine and New York, New Haven & Hartford railroads, twenty-eight miles west of Boston. Interurban —electric lines connect it with nearby cities and towns. Marlboro was founded in 1656, and in 1676, during King Philip's War, raiding Indians almost completely destroyed the settlement.

Marlboro has extensive and varied manufacturing interests. Its products include shoe-making machinery, wire goods, electrical supplies, machine shop products, woodenware, miners' supplies, cigars, carriages and bicycles. Pop., 1920, 15,028.

The city has adequate educational facilities, including a high school and a large public library; and it is the seat of Saint Ann's Academy. Among the attractive buildings are the city hall, post office and hospital. In 1920 the population was 15,028.

Marlborough, märl'bur-o, **Duke of** (1650-1722), an English general. His original name was John Churchill. He was born in Devonshire. At the age of twelve being a quick, attractive lad, he secured an appointment as page in the household of the Duke of York, afterward James II. He received a coveted appointment in the English army, saw service in Tangiers against the Moors, and in Holland, under the French Turenne, against the Dutch. Favored by native ability and friends at court, he rose rapidly.

When James II ascended the throne, he made him a peer of England with the title of baron and a seat in the House of Lords. When William of Orange landed at Torbay, James so far trusted his new baron as to place him in command of the troops sent to oppose William's advance on London. Though loaded with honors by the unfortunate James, Churchill did not hesitate to hold correspondence with William. In fact, when a battle seemed imminent, Churchill stole away by night into the camp of the Dutch invader. For his treachery he was made Earl of Marlborough and given a seat in the privy council; yet later he opened correspondence with James again. For this he was thrown into the Tower and narrowly escaped execution as a traitor to William.

In 1702 Anne ascended the throne. The Duke was made commander-in-chief of the English army at home and abroad. In the formation of the Grand Alliance against France by England, Holland, and Austria, the united forces of the three countries were put under his command. He exhibited consummate tact in harmonizing the jealousies certain to arise between allies. In the war that followed, known in history as the War of the Spanish Succession, he won the victories of Blenheim in 1704; Ramillies in 1706; Oudenarde, in 1708, and Malplaquet, in 1709. The British could have entered Paris, but owing to court jealousies, Marlborough was deprived of his command and accused of embezzlement. A fortune, however, was granted him for his military services, and he retired to private life. In 1714 he was again appointed captain-general by George, but he took no active part in public affairs. He died in 1722 and was first buried at Westminster Abbey. Later his remains were removed to Blenheim. Marlborough House is the London residence of the Prince of Wales. See BLENHEIM.

Marlowe, Christopher (1564-1593), an English playwright. He is interesting chiefly as a forerunner of Shakespeare, to whom he was a not unworthy John the Baptist. He was educated at Cambridge. He was killed in a drunken brawl. Readers will do well to begin with his *Jew of Malta.* The Jew Barabbas is a far worse character than Shylock, and is without the latter's redeeming qualities. *Faustus* is a characteristic play. It suggests Goethe's *Faust.* In *Tamburlaine the Great,* a shepherd of Titanic disposition aspires to the throne of Persia and aims to ride into power over the bloody remains of his opponents.

Marlowe, Julia (1870-), an American actress, was born near Keswick, England. Removing to America with her parents when five years old, she appeared in a juvenile opera company at the age of twelve. This company presented light operas, such as *Chimes of Normandy* and *Pinafore.* Miss Marlowe played child parts in *Rip Van Winkle* for a time, and then left the stage for serious dramatic study. Making her debut in 1888 as Parthenia in *Ingomar,* Miss Marlowe won a place as a star. She is an actress possessed of unusual personal charm. Her greatest success attended her work in Shakespearean roles such as Portia in *The Merchant of Venice,* Juliet in *Romeo and Juliet,* and Rosalind in *As You Like It.* Miss Marlowe retired from the stage in 1915 on account of ill health.

Marmion, A Tale of Flodden Field, a narrative poem by Sir Walter Scott. The poem was begun in November, 1806, and was published in February, 1808. The first edition of 2,000 copies in quarto form was

sold at a guinea and a half, $7.50 per copy. A second edition was required within a month, and cheaper editions followed in rapid succession. In all some 50,000 copies were sold during the author's lifetime. The poem is in six cantos, each canto preceded by a lengthy introduction in the form of an epistle to a friend. These introductions to the various cantos are not necessary to the thread of the story; on the contrary, they rather interfere with it, at least at a first reading. The hero of the story, Marmion, is an English knight whose various adventures in Scotland are narrated in the poem. The last canto describes the battle of Flodden Field in which Marmion falls. See SCOTT.

Marmora, a sea between Asia and Europe. The waters of the Black Sea reach it through the Bosporus. It discharges its waters into the Aegean through the Dardanelles. It bears much the same relation to the Black Sea and the Mediterranean that is sustained by Lake St. Clair to Lakes Huron and Erie. Length, 170 miles; greatest width, 50 miles. An island of the same name lies in the sea. It is about eleven miles long. See HELLESPONT.

Marmoset. See MONKEY.

Marmot, a burrowing animal belonging to the group of ground squirrels. The common marmot inhabits the Alps, Pyrenees, and the more northern mountains just below the snow line and lives on insects and vegetation. They are the largest of the squirrel family, are about two feet long, and covered with long coarse hair. They have small ears and short, bushy tails. They are often a menace to gardens and farms. The ground-hog or woodchuck belongs to this group. Prairie dogs also are marmots

Marne, Battle of. See WAR THE GREAT.

Marque (märk) **and Reprisal, Letters of,** the permission granted by a state to private individuals to fight the enemy in time of war. The origin of the term probably is due to the fact that permission is given to wage war beyond the mark or border; or perhaps to the French *lettres de marque,* meaning marked or stamped letters. Vessels sailing under such are known as privateers. International law discourages the practice since much damage is done to merchantmen, with scarcely any effect upon the naval situation. Moreover it offers opportunity for reckless and criminal crews to advance piracy as the War of 1812 amply illustrates.

Marquette, mär-kĕt', **Jacques** (1637-1675), a French Jesuit missionary and explorer. He was born at Laon, France, and died on the shore of a small stream, now called the Marquette, in Michigan. He was educated in France, and having joined the Jesuits was sent to Canada in 1666. He spent a year and a half at the Three Rivers Mission learning the language and customs of the Indians. He became an adept in the management of a canoe and in woodcraft. In 1668 he opened a mission among the Hurons at Sault Ste. Marie. In 1671 his charges were hard pressed by the Sioux, and he removed with them to the Island of Mackinac. He built a chapel here, or at St. Ignace. In December, 1672, he was visited by Joliet, bearing a commission to explore the Mississippi Valley and to take possession in the name of the French king.

In the following spring a substitute took Father Marquette's place at the Mission. Joliet, Marquette, and seven men set off in two birch bark canoes bound on a voyage of exploration. They followed the shore of Green Bay to the mouth of the Fox River and ascended that stream to Lake Winnebago. Rumors of the Father of Waters increasing as they advanced, they paddled up the headwaters of the Fox, portaged into the headwaters of the Wisconsin, and descended that stream, floating out on the broad waters of the Mississippi June 17, 1673. They then went down the Mississippi about 300 miles below the mouth of the Arkansas, suffering frightfully from swarms of mosquitoes. They returned to Lake Michigan by way of the Illinois River, portaging at Sturgeon Bay into Green Bay again, a canoe journey all told of nearly 3,000 miles. The reports of Joliet were lost in Lake Erie. An account of the journey by Marquette is still extant and has been drawn upon freely by Parkman in his history of the Jesuits in North America.

Father Marquette was no doubt much worn by his toils. He labored for a year

or two longer to establish further missions. At his death his remains were borne by faithful Indian friends to St. Ignace. They were buried in the chapel. In 1706 the chapel was burned, but in 1877 the pastor of the present Catholic church there discovered the grave. The remains of the explorer now rest under a suitable monument erected to his memory in 1882 by the citizens of St. Ignace. A lake port and county of the upper peninsula of Michigan bear his name.

See JOLIET; LA SALLE.

Marquette, Mich., an industrial city and the county seat of Marquette County, is situated on Iron Bay, an arm of Lake Superior, 400 miles north of Chicago. The city has a fine harbor and is served by several lines of steamers, as well as by the Duluth, South Shore & Atlantic and the Munising, Marquette & Southeastern railroads.

Marquette, because of the scenic beauty of the country immediately surrounding it, and because of its fine summer climate, is a popular resort; but it is chiefly important as the shipping point for iron ore and lumber. Its industrial plants produce iron, chemicals, foundry and machine shop products, lumber, wood alcohol, sashes, doors and blinds. Near the city are valuable quarries of sandstone and trap rock.

The most notable buildings are the Peter White Library, Saint Luke and Saint Mary hospitals, State House of Correction, Northern State Normal School, the Federal building, the upper peninsula branch of the state prison and several churches. Presque Isle Park is the largest public playground. Population in 1920, 12,718.

Marquis, mär'kwis, a title of nobility. In the British House of Lords, a marquis ranks next to the highest order, that of a duke. He is addressed as "my lord Marquis"; his wife as "my lady Marchioness." The coronet is a golden band surmounted by four golden leaves and as many large pearls. All are of equal height and are connected by a golden wire or vine. The first British nobleman of the rank was Robert de Vere, created Marquis of Dublin in 1385.

Marriage, the legal union of a man with a woman for life, in the relation of husband and wife; or the state or condition of being married. In this sense marriage is a status which, though originating in a contract, is not capable of being terminated by the parties rescinding the contract, because the interests of the state and of children that may be born of the union require the fixing of certain duties and obligations upon the parties.

The term marriage is also applied to the formal declaration or contract, by which act a man and a woman join in wedlock. In this sense, marriage is a civil contract, implying the free and intelligent mutual consent of competent persons to take each other as husband and wife; and according to the modern and most prevalent view, no formalities other than such as the law of the jurisdiction may expressly impose are necessary to prevent either from subsequently repudiating the other. The formalities provided for by the laws of some of the states of the United States are optional, being intended chiefly to enable the parties to preserve authentic evidence of the contract. When a man and woman live together and conduct themselves as man and wife in the society and neighborhood of which they are members, till the belief and reputation that they are married become general, their marriage is presumed, without other evidence, for the purpose of enforcing rights and liabilities of third persons.

No two systems of laws are exactly agreed either as to the mode of constituting marriage, the rights which it confers, or the obligations which it imposes. Historical inquiry shows that marriage laws were not originally the invention of legislators, but growths from the experience and necessities of society, which could not advance far without rules for the appropriation of men and women to each other securing them in the enjoyment of each other's society and defining their obligations to their progeny. But while experience and necessity led to the institution of marriage, the forms of the institution were exceedingly various. Thus we have monogamy, or one wife to a husband, which

is the rule among the most advanced nations, and the general practice of mankind; polygamy, or a plurality of wives, as practised by the Turks; and polyandry, or a plurality of husbands, to one wife, which is customary in Tibet and some of the islands of the Pacific.

In the United States, the validity of marriage depends upon the laws of the place where it is contracted, or solemnized. Thus the Book of Common Prayer of the Protestant Episcopal Church in the United States says: "The laws respecting matrimony, whether by publishing the banns in churches, or by license, being different in the several states, every minister is left to the direction of those laws, in everything that regards the civil contract between the parties."

It seems to be the acknowledged principle of the common law that marriage is not void on account of its irregular celebration, nor does it require ecclesiastical sanction to give it validity. It is considered in the light of a civil contract merely, and no particular form is required. This doctrine of the common law forms the basis of the law upon the subject in most of the states, modified by their own statutes, which establish a variety of rules, with which the decisions of the courts sometimes conflict. Thus, in some states, the law requires a certain period of residence and the procuring of a license from a county clerk as an essential preliminary to marriage, but the subsequent ceremony may be either civil or religious, at the option of the parties. In other states, no preliminary license is required, or licenses are freely issued to non-residents.

The general result may be summed up as follows: (1) Where the parties are not within the prohibited degrees of consanguinity (not first cousins or nearer) and within the age of consent, mentally capable of giving consent and did actually consent, and the marriage was celebrated in accordance with the state law, such marriage is valid, even though the parties separated and never thereafter lived together as man and wife; (2) Where the marriage has been celebrated irregularly, as before persons without the regular authority, or without complying with the law in other respects, such marriage is considered valid if followed up by living together as husband and wife, though the parties aiding in the ceremony may be liable to a penalty for the violation of the law, and though without being followed up by living together it might be invalid to secure marital rights, as dower, etc., or to support a prosecution for bigamy.

Morganatic Marriage, the term applied to a marriage of a member of a reigning house with a woman of inferior rank. In some countries, the term is also applied to the marriage of one of the higher nobility with a woman of inferior rank. A morganatic marriage is legal, but it cannot exist with a perfect marriage. The children do not inherit the father's rank nor position. They are likewise excluded from any share in the entailed estate. The custom is founded on an early German law, which gradually extended to other countries.

Marriotte's Law. See Boyle.

Marryat, Frederick (1792-1848), a British writer. He was a native of London. He served in the British navy from 1806 to 1830 and was stationed at St. Helena when Napoleon died there. He published his first story, *The Naval Officer,* in 1829. On his retirement with the rank of captain he continued to write tales of sea life addressed to boys. *The Phantom Ship, The King's Own, Peter Simple,* and *Midshipman Easy* are some of his titles. His tales are not of a high order from a literary point of view, but they are entertaining and instructive.

Mars, the Roman god of war, whence such expressions as martial, or warlike, and a follower of Mars, or soldier. He was regarded also as a patron of husbandry. In art Mars is represented as a powerful, eager youth, with helmet, spear, and shield, ready for conquest. The great parade ground in Rome was called the *Campus Martius,* or Field of Mars. Mars is the Greek Ares.

Mars, the planet next outside of the earth in the solar system. Its mean distance from the sun is one and one-half times that of the earth. As the distance from the earth is anywhere from 35,000,000 to

250,000,000 miles, Mars is fifty times as bright one time as at another. It is conspicuously red or fiery in color, and moves in an apparently lawless, vigorous way,—qualities which led the ancients to give it the name of their god of war. Many have argued that conditions in Mars warrant a belief that it is inhabited. Its day is longer than ours by half an hour. Its year consists of 687 of our days, giving longer seasons. Its surface is about two-sevenths and its volume one-seventh of that of the earth. A body weighing 100 pounds on the earth would weigh about 38 pounds on Mars. With the same strength one could leap three times as high on Mars as on the earth. Mars has an atmosphere. White caps at the poles grow larger and smaller with the change of season, suggesting fields of polar snow. The surface of the planet is furrowed with apparent canals which are conjectured by some to be irrigating canals. Changes in the color of large areas are attributed to alternating seasons of vegetation and drought. All these speculations are without much foundation in the presence of a strong probability that the planet is frigidly cold. Mars has two small moons with months of eight days and thirty days. Their recent discovery (1877) has turned the laugh on Swift who, in apparent derision of astronomers, wrote in *Gulliver's Travels*, "They have discovered two lesser stars, or satellites, which revolve about Mars, whereof the innermost revolves in the space of ten hours, the outermost in twenty-one and one-half." See PLANETS; SATELLITES.

Marseillaise, mär-sā-yāz′, the song of the French Revolution. In 1792, when a column of volunteers was about to march from Strasburg, the mayor of the city gave a banquet in their honor. He asked an officer of artillery, Rouget de Lisle, to compose a song for the occasion. The young man, being fired with enthusiasm for the Revolutionary cause, composed both song and music in a single night. He called it the war song of the army of the Rhine. It was a complete success. It was sung at the banquet with such enthusiasm that the column of 600 men was swelled by volunteers to 1,000 on the spot. The army of the north and eastern France took up the song. The Parisians heard it for the first time when an enthusiastic column of Marseilles youth reached the city. The populace went wild over the song and, ignorant of its real authorship, called it the Marseillaise. It is the national anthem of France.

> Forward, forward, countrymen!
> The glorious day has come!

Marseilles, mär-sālz,′ the second city of France. It is the first seaport of France and the fourth of Europe. It is situated on the Gulf of Lyons, on a bay having an area of seventy acres. This natural harbor has been increased by the addition of about 200 acres of artificial docks or basins. Marseilles is the center of French business on the Mediterranean coast. The railroads of southern France center here. It is the port of departure for the French department of Algeria. Lines of steamships run to the East Indies and to various Mediterranean ports, as well as to the ports of the German Ocean, Great Britain, and to New York. The streets of the city are arranged with reference to two avenues. One runs directly inland from the old harbor. Another great thoroughfare crosses it at right angles. These streets are planted with trees and are lined with handsome buildings and residences. The shops of Marseilles rival those of Paris in brilliancy.

Although Marseilles was founded by a colony of Greeks, 600 B. C., there are few antiquities of note, the city being essentially modern. The church of Notre Dame, on a hill commanding a fine view of the harbor, may be seen far out at sea. It is held in reverence by the sailors of the Mediterranean. There are several learned societies at Marseilles. The city possesses a public library of 100,000 volumes, a picture gallery, and a natural history museum. It is one of the greatest soap manufacturing cities in the world. Other industries are the preparing of olive oil and the refining of sugar. Machinery, matches, candles, glass, and pottery are manufactured extensively. Shipbuilding is an important industry. The exports consist chiefly of soap, olive oil, wine, brandy, dried fruits, and oranges. The productions of Algeria and the French possessions in the East Indies are received here for reshipment.

The situation of Marseilles, facing the south, long rendered it subject to summer

drouth of a distressing character. An abundant supply of water has been brought into the city by means of a magnificent aqueduct. Dooryards have been transformed from burning rocks and arid sand into gardens of fruit and flowers. Surrounding districts, formerly barren, have been transformed into fertile fields, vegetable gardens, and orchards. The population in 1921 was 586,341.

Marshall, John (1755-1835), the most famous of American jurists, Chief Justice of the United States Supreme Court for 34 years, the longest term in the history of that tribunal. He was born at Germantown, Va., studied privately and at an academy in Westmoreland County, and was studying law at the outbreak of the Revolutionary War. Volunteering in the army, he arose to a first lieutenancy, and, in 1777, to the rank of captain. He suffered through the memorable winter of 1777-78 at Valley Forge, and participated gallantly in the battles of Brandywine, Germantown, Monmouth and Stony Point.

After attending a course of lectures at William and Mary College in 1780, Justice Marshall was admitted to the bar. After serving several terms in the Virginia legislature he was chosen delegate to the state convention that adopted the Federal Constitution. He and James Madison led the debate in favor of ratification. After a few very successful years as an attorney, Justice Marshall was asked by President Washington to accept the position of Attorney General of the United States. This honor he declined. In 1797, however, he went to Paris with Elbridge Gerry and C. C. Pinckney to settle for the United States several questions that had arisen from restrictions on American commerce. The negotiations were fruitless, but Justice Marshall's conduct proved more pleasing to his government than did that of his colleagues. In 1800 he was elected to Congress, where he voted for the repeal of the Alien and Sedition Acts. In the same year he held the position of Secretary of State, serving for a few months.

On January 31, 1801, he was commissioned Chief Justice of the United States Supreme Court. In all of his career in this position, Justice Marshall displayed marvellous power of analysis and clearness of statement. He dominated the court, won it profund recognition and respect, and so expounded the Constitution as to make clear for the first time the nature of the national government. He could resolve the most complex legal tangles into their ultimate principles, and could present any case in so many forms and colors as to make his decisions irrefutable. In the famous Marbury-Madison case, Justice Marshall established the authority of the Federal courts to set aside an act of Congress on the grounds of its unconstitutionality. See STORY, JOSEPH.

Marshall, Thomas Riley (1854-1925) lawyer and statesman. He was born in Indiana of parents connected with the Marshalls of Virginia and the Carrolls of Revolutionary fame. His graduation with honors at Wabash College in 1873 was followed by his admission to the bar on the day he became twenty-one years of age. He gradually came into prominence as an attorney but refused various offers of nominations till urged as the democratic candidate for governor of Indiana in 1908. He was elected and soon became a national figure. He was the choice of his state as candidate for president before the national democratic convention of 1912, but finally secured the vice-presidential nomination. With Woodrow Wilson heading the ticket, his party achieved a notable victory, and in 1916 Mr. Marshall was reelected for the term 1917-21. He was an opponent of woman's suffrage but strongly advocated the League of Nations.

Marshall, Texas, the county seat of Harrison County, 40 miles west of Shreveport, La., and on the Texas & Pacific and the Marshall & East Texas railroads. The city is in a fertile agricultural region adapted to the growing of cotton, fruit and vegetables. Peaches thrive especially well in this region. In the vicinity are valuable forests of pine and oak, and Marshall is the market for the lumber produced. Extensive stock raising is another source of revenue. Car and machine shops of the railroads serving the city are maintained here. There are also wagon

factories, a cotton-seed oil mill, machine shops and brick works.

The city contains the College of Marshall, a junior college for whites, Wiley University and Bishop College, both for colored students. There are good public schools and a Carnegie library. Population, in 1920, 14,271.

Marshalltown, Ia., the county seat of Marshall County, is situated 68 miles northeast of Des Moines, on the Chicago & Great Western, the Minneapolis & S. Louis and the Chicago & Northwestern railroads. Marshalltown is the center of a rich agricultural and stock raising region, and it is the shipping point for large quantities of corn and hogs. It contains meat packing plants, a glucose factory, furnace works, and a canning and bottling establishment.

It is the seat of St. Mary's Institute, and of the Iowa State Soldiers' Home, and has modern schools and a public library. In 1920, the population was 15,731.

Marshmallow, an herb related to the hollyhock and hibiscus. It has rose-colored flowers, not unlike the mallow of dooryards. It is cultivated chiefly in Europe. The root is an article of commerce. It is used in the manufacture of mucilage. It possesses medicinal qualities also, and also a well known flavor. Like peppermint, it is used in the manufacture of confectionery, giving its name to the candies known as marshmallows. The plant grows wild in places along the eastern coast of the United States.

Marston Moor, the English plain on which the forces of King Charles I under Prince Rupert were beaten by the Parliamentary armies under Cromwell and Fairfax in 1644, is in Yorkshire. The result of this victory was the Parliamentary control of York and practically the whole northern part of England. Thereafter the power of Charles waned rapidly.

Marten, a fur-bearing animal of the weasel family. The American or pine-marten is about twenty-four inches in total length. It is found throughout the northern row of states and northward to the timber limit. The fur is of a dark brown color and is much prized. The body is clothed with hairs of three lengths, long, fine hairs, middle-length kinky hairs, and a close, fine, short fur, which renders the animal indifferent to cold or water. The marten is a flesh-eating animal with habits like those of the weasel. The fisher is a larger black marten ranging from Pennsylvania to Hudson Bay and westward. It has a length of about thirty-five inches including its tail, and is named from its proclivity for a fish diet. It is sometimes called the black-cat. The pine-marten is sometimes called the American sable. See SABLE; FUR.

Martel, Charles. See CHARLES MARTEL.

Martha's Vineyard, an island on the south coast of Massachusetts, is twenty-one miles long and about six miles wide. It is a noted resort and has a large transient population in the summer. Its permanent population is about 5,000.

Martial Law. See LAW.

Martin, a bird of the swallow family, well known from Hudson Bay to the Gulf. The male is a shiny blue-black fellow, with lighter underparts fading into a white center. The martin is one of the most familiar of birds, preferring a bird house or a hole in the cornice of some building. Four to five white eggs are the usual number. Martins are very industrious. A hundred visits per day by each of the parent birds to the nest with food is not uncommon.

Martin Chuzzlewit, a novel by Charles Dickens, produced in twenty monthly installments, 1843-1844, and published in book form in 1844. The central ideas of the story are hypocrisy and selfishness, and these characteristics are exemplified in Mr. Pecksniff and Jonas Chuzzlewit. Dickens himself said of the book that it was intended "to show how selfishness propagates itself, and to what a grim giant it may grow from small beginnings." The scene of the story is laid partly in America, exhibiting that side of American character which appealed to the author as ludicrous. Land "booming" and mushroom cities come in for a share of attention. *Martin Chuzzlewit* is ranked by some critics as Dickens' best novel. It is certain that some of its characters, such as Pecksniff, Mark Tapley, Sarah Gamp, and Betsy Prig are among his most vivid delineations. To the average

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Mont Pelée, Martinique, in Eruption (June, 1902).

reader, however, the story is not equal to *David Copperfield,* nor to *Bleak House;* and falls below *Our Mutual Friend* and *Nicholas Nickleby.*

Martineau, mär′tĭ-nō, **Harriet** (1802-1876), an English author. She was born without the senses of taste and smell, and became very deaf at the age of sixteen. In 1830-1 she wrote three essays for the Unitarian Association, designed to be circulated as tracts, looking to the conversion of Catholics, Jews, and Mohammedans to Unitarianism. A critic writes: "The essays probably converted nobody, but brought in forty-five guineas." She traveled in the United States, lecturing in support of the Abolitionists. She wrote *The History of England During the Thirty Years' Peace, The Philosophy of Comte, British Rule in India, The Endowed Schools of Ireland, Forest and Game Law Tales,* and *A Retrospect of Western Travel.* She is remembered chiefly as the author of *The Peasant and the Prince,* a story of French life for juvenile readers into which she weaves the theories of Malthus, Ricardo, and James Mill.

Martinique, mä-tĭ-nek′, an island in the Lesser Antilles group of the West Indies. It is particularly noted for a volcano in the northern part, Mount Pelée. In 1902 this mountain startled the world by an eruption which destroyed the town of St. Pierre and its 30,000 people. The outbreak occurred May 8, after two weeks of lesser disturbances which should have warned the people. The final catastrophe was in the nature of a violent explosion. Death of the victims is thought to have been instantaneous.

Columbus discovered the island of Martinique in 1502. Over a hundred years later the French under D'Esnembuc built a fort on what subsequently became St. Pierre. There was repeated controversy over the island between the English and the French. Fort de France is the capital. The island is populated mostly by Negroes and mulattoes.

Martinsburg, W. Va., the county seat of Berkeley County, is situated in the lower Shenandoah Valley, 75 miles west of Washington, D. C., and on the Baltimore & Ohio and the Cumberland Valley railroads. This region is abundantly productive of fruit, especially of peaches and apples, and extensive deposits of slate and limestone in the vicinity add to the city's wealth. The Baltimore & Ohio Railroad has repair shops here, and among the city's manufactures are lime, woolens and worsteds, hosiery, wagons, canned goods and cement.

The city contains the Berkeley Female Institute, a library and good public schools. It was an important center of military operations in the Shenandoah Valley during the Civil War. In 1920, the population was 12,515.

Martin's Ferry, Ohio, an industrial city, is situated on the Ohio River, nearly opposite Wheeling, W. Va. It has barge and steamboat connections, and is served by several railroads. In the immediate vicinity are valuable deposits of coal, iron and limestone. The principal manufactures are glass, tin, sheet steel, boxes and barrels, heaters, stoves and galvanized ware.

Martin's Ferry has a fine Federal building, and modern schools. A settlement was made at this point on the Ohio as early as 1769, but not until almost a century later, in 1865, was it incorporated as a village. The population was 11,634 in 1920.

Martiny mär-tē-ni′, Philip, (1858-), an American sculptor, whose works adorn many buildings in Washington, D. C. He was born and received his early education in Alsace, where the renowned Eugene Dock had charge of his studies. He showed signs of genius very early and came to the United States in the eighties, where he came under the dierction of Augustus Saint-Gaudens. In many cities of the east his statues grace public buildings. He created the Soldiers' and Sailors' Monument, Jersey City, N. J., the grand staircase of the Congressional Library, Washington; the monument to Admiral de Gernay, Newport, R. I.; and the sculpture in the Carnegie Library, Washington.

Marvel, Ik. See MITCHELL, DONALD G.

Marvel of Peru. See FOUR-O'CLOCK.

Marx, Karl (1818-1883), a German socialist. He was educated at the Univer-

sities of Bonn and Berlin. He is regarded as the father of German socialism. In 1842 he became the editor of the *Rheinische Zeitung* (Rhine Times), a paper of democratic tendencies. It was suppressed by the government in the following year. He went to Paris and engaged again in journalism. In 1845 he was expelled from France and went to Brussels where he organized a German workingmen's association. In 1848 he returned to Germany and revived his *Zeitung*. He took part in the socialistic revolution of that year, and was again banished. He went to Paris, then to London, where he remained during the rest of his life, writing books and articles for newspapers. He was a correspondent for a time of the New York *Tribune*. His articles, afterward published in book form, aimed to give an idea of industrial conditions in Germany. In 1864 he was instrumental in organizing the International Working Men's Association. In 1873 his first serious work, *Capital,* appeared. While it is not practicable to go into a detailed statement of his arguments, it may be said that he believed in the management of industries by the state, not by individuals. He went farther than municipal and government ownership of railroads, telegraph lines, gas works, waterworks, and the like. He believed that manufactures and all other productive industries requiring capital should be owned by the government and managed for the benefit of workingmen. Wage earners should have all the profits, if any. In that case, there would be no opportunity for private individuals to amass fortunes, and capitalists as a class would cease to exist. He held that with a more equal distribution of earnings, a more general opportunity for education, compulsory industry on the part of the able-bodied, and state care for those who were unable to work, poverty and distress would disappear in civilized countries. See SOCIALISM.

Capital is the most terrible scourge of humanity; . . . it fattens on the misery of the poor, the degradation of the worker, and the brutalizing toil of his wife and children: just as capital grows, so grows also pauperism . . . the revolting cruelties of our factory system, the squalor of great cities, and the presence of deep poverty seated hard by the gates of enormous wealth.

Mary, The Mother of Jesus. Mary, probably descended from David and was related to Elizabeth, mother of John the Baptist. She became betrothed to Joseph, a Nazarene carpenter. Not long after this, in a vision from heaven, she was told that she would give birth to a king.

After the marriage of Mary and Joseph, they sojourned at Bethlehem, where Jesus was born. Then she and Joseph returned with the child Jesus to Nazareth, after the death of Herod the Great. She witnessed the crucifixion of Christ, and then came under the care of John, who had promised Jesus that he would give his mother shelter. There is a tradition, how authentic no one knows, that she died at Jerusalem 63 A. D.

Mary became an object of veneration during the third and fourth centuries, and she is a real power in church history. Her story, apocryphal in part, is pointed to with love by Christians the world over. Time has but increased her importance, and she is venerated not simply as a historical character, but as a real factor. The Christian Church has enlarged greatly on the Biblical account of Mary, until it is now very full and complete. It was natural that while pondering on the life and acts of Jesus, people would also consider in the same light His mother. There are many holy festivals celebrated in her honor, including Purification, February 2; Annunciation, March 25; Assumption, August 15; Nativity, September 8; and Conception, December 8.

Mary is held in veneration not only by the Christian churches of the West, but by those of the East, including the Armenian, the Abyssinian, the Coptic, the Syrian and the Greek.

At the period of the Renaissance in Europe, when a great many artists were engaged in religious painting, the Virgin Mary occupied a very prominent place. The conception is usually of Mary and the infant Jesus.

Mary, The Magdalene. Mary was a native of Magdala, on the Sea of Galilee. She was one of the most faithful followers of Jesus and his disciples. Her devotion is ascribed partly to gratitude to Jesus because he is believed to have cast out from her forever the seven evil spirits which

had infested her being. It was she who first threw herself at the feet of the Savior after the disciples had left.

Mary I (1516-1558), queen of England. She was born in London and died there. She was the daughter of Henry VIII and his first wife, Catherine of Aragon. During her young womanhood she was treated as a bastard, and was even required by her brutal father to sign a document declaring her mother's marriage illegal and her own birth illegitimate. She was restored to the order of succession three years before her father's death. Her mother brought her up as a Roman Catholic. She was not treated particularly well by her father, and had reason to complain during the short reign of her brother, Edward VI. Although the Protestants aimed to set her aside in favor of Lady Jane Grey, she ascended the throne July 16, 1553. She married Philip II of Spain, a Catholic monarch, and restored the Catholic prelates of England to the positions from which they had been dismissed by her father. Protestant insurrections broke out, leading her to consent to the execution of her Protestant rival, Lady Jane Grey. Under the leadership of the Catholic prelates the Church of England returned to the papal field. Persecutions were instituted against those who held out. About 200 Protestants are said to have been executed. The most notable of these were Cranmer, Latimer, and Ridley. Mary united with her Spanish husband in declaring war against France. The chief result, so far as England was concerned, was the loss of Calais, which the English had held for two centuries. Though known in English history as the "Bloody Mary," she is deserving of sympathy. From her earliest childhood she was the hope of the Catholic party, and could not be permitted to grow up with an independence of her own. Her marriage was arranged without consulting her preferences. On her accession to the throne she was supported by but a small portion of her subjects. She lived a life of suspicion and unhappiness. Her troubles are believed to have greatly shortened her life. She was succeeded by her half-sister, Elizabeth, Queen Bess of English history.

Mary II (1662-1694), queen of England. She was the daughter of James II. In 1677, while her father was still Duke of York, she married William, Prince of Orange. Although her father was a Catholic she was attached to the Church of England. When her father was dethroned by the English revolution of 1688 Mary and her husband, William of Orange, were declared joint possessors of the throne. The actual government devolved on William, except when he was absent from the island on military expeditions. William and Mary College in Virginia was named for herself and husband.

Mary, Queen of Scots, was born at Linlithgow Palace, near Edinburgh, December 8, 1542, and was executed at Fotheringay Castle, England, February 8, 1587. Her birth came but a few days before the death of her father, James V, at Solway Moss. A few months later, while still a babe in arms, she was crowned with ceremony at Stirling Castle. During her infancy Scottish affairs were managed by ambitious noblemen, known as regents. When six years old she was betrothed to Francis, the son and heir of the French king. In 1548 she was sent to Paris to be brought up in the brilliant and shameless court which revolved about Catharine de Medici. Ten years later she was married to Francis. Mary's mother was Mary of Lorraine, a member of the Guise family. It should be remembered that Mary was actually queen of Scotland. Her husband was the prospective king of France. Her ambitious uncles, the Guises, induced the newly married couple to assert a claim to the English throne, to which Mary had some faint title. This claim was received with approbation by the Catholics of England, and made the Protestant queen, Elizabeth, who had just ascended the throne, Mary's enemy for life. In the year following the marriage, Mary's husband was called to the throne of France under the name of Francis II. He died in 1560. Mary set sail from Calais for Leith, the port of Edinburgh. She is said to have wept as the shores of France faded from her sight. Elizabeth had refused her a peaceful safe conduct, and, in fact, sent out ships to intercept her, but Mary reached Leith and Edinburgh in safety.

During her absence the Scottish Reformation had taken place. Presbyterianism was now the established Church of Scotland. Mary acquiesced in the new order of things, but obtained permission to follow the teachings and practices of her own church in private. Her reign began auspiciously. She was a woman of vivacity, wit, youth, and wondrous beauty. Her hand was sought in marriage, not only by the noblemen of Scotland, but by princes of Europe and the ambitious nobles of Elizabeth's court. It is believed that her popularity and reputation for beauty further excited the English queen's jealousy. Had Mary married a respectable man at home and settled down to attend to the affairs of the kingdom, her life would have been different. Mary, however, was but a woman at the head of a turbulent body of ambitious, unprincipled nobles,—the Catholic queen of a Protestant country. Her private conduct soon degenerated into a tissue of deceit, intrigue, and it is believed, shameless living, without parallel even in the family history of the de Medicis. In 1562 a young noble who had come in her train from France was found in her bedchamber for the second time and expiated his offense on the scaffold.

Two years later Mary was married privately to her cousin, Lord Darnley, a man utterly without character or intellect. Their marriage was celebrated in public July 29, 1565. On the ninth of the following March her private apartments were invaded at the instigation, it is believed, of Darnley, and David Rizzio, an Italian who served her in the capacity of secretary, was dragged forth and slain at the very threshold of her waiting room. In the midst of the scandal brought upon the court by this occurrence, her son, James, afterward James I of England, was born. About this time Mary formed an attachment for Bothwell, a disreputable Scottish nobleman. An attempt was made to get rid of Darnley, it is believed by poison. This failing, he was lodged in an outlying building where the queen saw him for the last time, leaving him sick in body and in mind. That night the building was blown up with an explosion of gunpowder that shook Edinburgh to its very center. The dead bodies of Darnley and a page were found the next day. They had apparently been strangled. There is little doubt that Bothwell and his servants performed the deed. There is the strongest belief that Mary was privy to it. At all events, she put off from time to time judicial inquiry into the cause of Darnley's death, shielded Bothwell from prosecution, permitted him to intercept her when she was out riding one day, and ended by marrying the detestable scamp.

The sight of Mary and Bothwell riding down the streets of Edinburgh together in gay spirits was too much for the Scots. Her nobles rose in arms. Bothwell fled to the Orkneys, thence to Denmark, where he was seized and imprisoned. Mary was shut up in Loch Leven Castle. Murray was appointed regent. Mary corrupted George Douglas, the son of her jailor, and effected her escape. While she was making for Dumbarton Castle with a few thousand adherents, she was intercepted by the regent at Langside, near Glasgow. Her followers were scattered. Mary fled across the English border and threw herself upon the mercy of Queen Elizabeth. She was detained first in some state. She was removed finally to Fotheringay Castle. During Mary's imprisonment Elizabeth was in fear of a Catholic uprising. Spain and France were supposed to be ready to grant Mary assistance at any time. Whether Mary herself took an actual part in certain uprisings is still a matter of dispute. When these accusations were brought home to Mary, she defended herself before the English lawyers with great skill for a period of two days. Finally, however, the privy council of England decided on her death. Queen Elizabeth, after many delays, and with apparent reluctance, signed the death warrant.

The details of Mary's death excited a world-wide interest. She sent mementos to her friends, forgetting no one. She walked to the hall of execution with a firm step and met her fate at the hands of the headsman with a fortitude becoming one descended from a long line of princes. Her remains were buried at Peterborough. In 1612, her son having in the meanwhile become James I of England, her body was conveyed to Westminster and buried in a sumptuous tomb in the chapel of Henry

VII. Whatever her failings may have been, hers is without doubt the most observed of all the tombs in that great edifice.

Mary spoke and read four languages, Latin, French, Italian, and English. She had a winning voice, and was a singer of remarkable sweetness. Her body was well formed, her carriage stately. She showed to advantage on horseback and was a graceful dancer. She had a small, well formed hand. She delighted in embroidery and needlework. Her complexion was clear, her features sharp. She had hazel eyes of wonderful brilliancy.

See ELIZABETH.

Maryland, one of the south Atlantic states and one of the thirteen original states of the Union, lies between Pennsylvania, north; Delaware and the Atlantic Ocean, east; Virginia, south; and West Virginia, west. The state was named for Henrietta Maria, wife of Charles I of England. Its popular name, "The Old Line State," refers to Mason and Dixon's Line, which forms a great part of the northern boundary.

PHYSICAL FEATURES. About one-fourth of Maryland's total area, or 2,386 square miles, is water. The land area, which for the most part is arable, may be divided into Tidewater Maryland, which is the coastal plain; the piedmont plateau, beginning 40 miles inland from tidewater and extending westward to Catoclin Mountain; and the Appalachian region.

Tidewater Maryland is divided in the center from north to south by Chesapeake Bay. The land east of the bay is low and level, but that on the west, while level, is higher, attaining an elevation of about 300 feet at Baltimore. The piedmont region, unlike the eastern part of the state, is hilly, containing Sugar Loaf Mountain, 1,281 feet high, as well as the fertile Frederick Valley. Still farther west, in the Appalachian region, mountain ridge and valley running from northeast to southwest follow each other as far as the West Virginia line.

Maryland is very uneven in outline. From north to south the longest line is in the eastern part of the state; this line is 128 miles long. But in the west, near the state line, is a point where the northern and southern borders are but two miles apart.

A few insignificant rivers flow into the Atlantic; one flows into the Ohio river; but all the others, which are chiefly wide mouthed and easily navigable, empty into Chesapeake Bay. The important rivers are, first, the Potomac; secondly, those that flow westwardly into the bay, which, named from south to north are Pocomoke, Wigomico, Nanticoke, Choptank and Chester; thirdly, those that flow eastward into the bay—Gunpowder, Patapsco and Patuxent. The northeastern extremity of Chesapeake Bay is connected to the Delaware River by the Chesapeake and Delaware Ship Canal.

THE PEOPLE. The original settlers of Maryland were English Catholics led by Lord Baltimore, but there is a large French element in the population: this element originated with the French Catholics who emigrated to Maryland at the time of the French Revolution. In 1920 the population was 1,449,661. Roughly one-fifth of this number were Negroes. The largest city in Maryland is Baltimore, with a population of 733,826. It is the only city in Maryland that has more than 30,000 inhabitants, but there are many smaller cities. In 1920 the urban population comprised 50.8 per cent. of the total. The density in 1920 was 145.8 to a square mile.

MINERALS. Coal is the most important product of the mines of Maryland; some iron is found, and there are deposits of lime, granite, limestone, pottery clay and roofing slate. The coal deposits were found in 1804 or thereabouts, but were not extensively worked until more than a quarter of a century later. The coal is bituminous, and is of good quality.

AGRICULTURE. A diversified surface gives Maryland a diversified climate, which, with a variety of soils, admits of the cultivation of a wide range of crops. In the southeastern part of the state are grown fruits and cereals that are usually not found in the latitude of Maryland. Berries, vegetables and orchard fruits are more extensively cultivated than are cereals. Peaches, apples, strawberries and tomatoes do especially well. Tobacco is grown in

the southern part of the state. Corn, wheat and oats are the principal cereals.

Dairy farming and poultry raising are especially profitable because of the quick and cheap access to large markets. The live stock section is in the central plateau.

Fisheries. The Maryland fisheries are an important source of wealth, especially the oyster beds. The rivers yield hard- and soft-shell crabs, bass, sturgeon, perch, terrapin and other fish. The oyster beds were for many years subjected to no regulation, and were in consequence, stripped year after year until Maryland began to lose rank as an oyster producer; but regulative measures have been applied to the taking of oysters since 1916; and the state will undoubtedly get back to the front ranks of oyster producing states.

Manufacture. Manufacture has been important in Maryland since early in the state's history. Fruit, vegetable, fish and oyster canning take high rank, but the manufacture of men's clothing is the most important industry, Maryland usually ranking fourth in the production of this commodity. Canned tomatoes from Maryland represent about one-half of the total for the United States. There is but little water power in the state, but transportation facilities have favored industry.

Transportation. In 1920 there were 1,440 miles of steam road and upward of 1,000 miles of electric lines. The public roads are in very good condition; those in the eastern part of the state are as fine as can be built. Chesapeake Bay is navigable for the largest steamers afloat, and the rivers afford hundreds of miles of additional waterway.

The important railroads are the Baltimore & Ohio, Northern Central, West Virginia & Pittsburgh, Chesapeake & Ohio, Philadelphia, Baltimore & Washington, Western Maryland, and Chesapeake & Atlantic.

Education. The educational facilities of Maryland are very good. The primary schools are adequate to the needs of the populace, and the improvement of secondary educational facilities was insured by the reorganization by legislative enactment of the state board of education.

Maryland maintains normal schools at Towson, Bowie and Frostburg; and the prominent seats of higher education are Johns Hopkins University, Saint John's College, Western Maryland College, University of Maryland (comprising the former State College of Agriculture), Blue Ridge College, Woman's College at Frederick, Maryland College for Women, Goucher College, Loyola College, Mount Saint Mary's College, Mount Saint Joseph College, United States Naval Academy, Rock Hill College and Jacob Tome Institute at Port Deposit. Morgan College at Baltimore is a co-educational school for colored students.

History. As is the case with all of the original states, Maryland has an interesting history. On Kent's Island the first white settlement was established in 1631; William Claiborne, a Virginian, was the founder. The territories of the present states of Maryland and Delaware were granted to the first Lord Baltimore, William Calvert, by Charles I. The territory was to have been a refuge for Catholics, but conflict arose between the Catholics and the English and Virginia Protestants led by Claiborne, who refused to recognize the sovereignty of Lord Baltimore. After having been twice seized, the government was finally and definitely restored to the fifth Lord Baltimore in 1715. Later, a boundary dispute arose with Pennsylvania, but this was settled by the establishment of Mason and Dixon's line in 1767.

In the French and Indian and Revolutionary wars the state took a large part, and it suffered several attacks during the War of 1812. Maryland was a slaveholding state prior to the Civil War, but its decision not to secede from the Union meant much to the northern cause; the decision undoubtedly saved Washington from falling to the Confederates.

Statistics. The following are the latest statistics to be had from trustworthy sources:

Land area, square miles	9,941
Water area, square miles	2,386
Forest area, acres	2,228,000
Population (1920)	1,449,661

White	1,204,737
Negro	244,479
Foreign born	102,177
Chief cities:	
Baltimore	733,826
Cumberland	29,837
Hagerstown	28,029
Frederick	11,066
Annapolis	11,214
Number of counties	23
Members of state senate	27
Members of house of representatives	102
Salary of governor	$4,500
Representatives in Congress	8
Assessed valuation of property	$1,392,944,923
Bonded indebtedness	$28,364,880
Farm area, acres	5,057,140
Improved land, acres	3,354,767
Corn, bushels	25,155,000
Wheat, bushels	7,952,000
Potatoes, bushels	3,185,000
Tobacco, pounds	18,590,000
Tomatoes, tons	72,811
Wool, pounds	825,000
Domestic Animals:	
Horses	158,000
Mules	25,000
Milk cows	180,000
Other cattle	136,000
Sheep	220,000
Swine	427,000
Manufacturing establishments	4,937
Capital invested	$619,606,983
Operatives	140,342
Raw material used	$549,347,379
Output of manufactures	$873,944,774
Coal, short tons	3,616,071
Miles of railway	1,440

See BALTIMORE; CHESAPEAKE BAY; JOHNS HOPKINS UNIVERSITY.

Maryland! My Maryland! A song popular among the Confederates during the Civil War. It was written by J. R. Randall in 1861. The tune is that of *Lauriger Horatius,* a college song.

Mascagni, Pietro (1863-), an Italian operatic composer who is best known for his popular one act opera, *Cavalleria Rusticana.* He was born at Leghorn, Italy, and studied at the Milan Conservatory. Later, he was appointed director of the Municipal School of Music at Cerignola. None of Mascagni's later works have become as popular as the one mentioned, which was his first. In 1902 he visited the United States, but his tour was not very successful. His other operas are *L'Amico Fritz, I Rantzau, Silvano, Iris, Les Maschers, Amica, Isabeau Parisina* and *Il Piccolo Marat.*

Masefield, John (1876-), an English poet and dramatist, whose fresh and rugged poems and plays throb with the life blood of the common people with whom almost all of his life was spent. Born on a farm in Ledbury, England, he ran away to sea in the ship *Conway* when only fourteen years old. He made many voyages, living an adventurous, elemental life among the people one meets in all his writings. At one time Mr. Masefield was a farm laborer, and at another a bartender in a New York saloon. The lowest strata of society have for him no mystery. His sea poems such as *Salt Water Ballads, A Mainsail Haul, On the Spanish Main* and *Captain Margaret* have in them the very swing and flavor of the deep. They are a vivid blend of romance and realism. Other poems by Mr. Masefield are *The Widow in the Bye Street, Daffodil Fields, The Everlasting Mercy, Good Friday and Other Poems;* and among his plays the most important are *The Tragedy of Nan, Philip the King* and *The Tragedy of Pompey the Great. Jim Davies* is one of his finest stories for boys.

Mask, or **Masque,** a form of dramatic entertainment popular in England during the sixteenth and seventeenth centuries. It was introduced into England from Italy. The mask took its name from the fact that the performers, who were usually amateurs, wore masks. It was presented at a castle to celebrate some special event or honor some noble. The mask was allegorical in character.

Milton's *Comus* is regarded as the finest example of a mask in the English language. See COMUS.

Mason City, Ia., the county seat of Cerro Gordo County, is situated on Lime Creek and on several railroads, 150 miles north of Des Moines. It is in a fertile agricultural and high-bred stock raising region, and valuable deposits of shale, clay and limestone are found in the vicinity. The city contains extensive drain and building tile, brick, and cement works, and has a packing house, and a sash and door factory. It is also the distributing center for an extensive agricultural and stock raising region. It has an orphans' home, a public

library, Y. W. C. A. building and modern public schools. The water works are owned and operated by the city. In 1920, the population was 20,065.

Mason and Dixon's Line, a line forming the northern and the eastern boundary of Maryland. It takes its name from Charles Mason and Jeremiah Dixon, two English engineers.

Disputes having arisen between colonists, these surveyors were sent over by the Baltimores, proprietors of Maryland, and by the heirs of William Penn, proprietors of Pennsylvania, to fix the boundary. They did their work between the years of 1764 and 1767, and did it with so much accuracy that a re-survey in 1849 discovered no errors of importance. In 1901-3, to settle local disputes, a joint appropriation of $5,000 was expended by the states of Pennsylvania and Maryland in marking the line from Delaware westward. It is a straight east and west line. Its eastern continuation would pass just fifteen miles south of Philadelphia. Midway it coincides with the parallel of 39° 43′ 26.3″ north latitude. Mason and Dixon brought milestones with them from England. These were of limestone, four and one-half feet in length and a foot square. One side bore M for Maryland, the other P for Pennsylvania. On every fifth stone were chiseled the arms of the proprietors. The stones weighed 500 pounds each. The surveyors of 1901 found that many of these stones had disappeared or had been put to strange uses, such as doorsteps. Some were rescued from foundations. Two had been used in constructing a church. One in Clear Springs, Maryland, was serving as a curb stone; others were found built into bake ovens, etc. It was known that a sufficient number of stones was imported to mark the entire line. It is conjectured that, owing to their great weight and the lack of roads in some localities, loads of the stone were left here and there and never set up. Toward the western end of the line, in particular, mounds of earth and wooden posts were found doing duty in their stead. By a diligent search the surveyors succeeded in recovering all but seventy-five of the missing stone. Broken ones were repaired with iron clamps. To prevent their removal, they were set up in concrete foundations. The missing milestones were replaced by new marble stones. In United States history, Mason and Dixon's Line is known as the dividing line between slavery and freedom. It should not be confounded with the compromise line of 36° 30′ north latitude.

See DIXIE.

Mason and Slidell. See TRENT AFFAIR.

Mason Bee, a small wild bee. It constructs a solitary nest of sand or gravel fastened together with a sticky saliva manufactured by the bee. The nest is placed in the sheltering angle of a wall, under a stone, or even in a place hollowed out in the pith of a leaf or twig. The queen bee usually constructs a number of cells in the same fastness, each of which contains a single egg and a store of honey for the young larva to feed upon. See BEE; WASP.

Masons, an abbreviated term for Freemasons, or the members of an order, fraternity, or brotherhood forming a secret society, or series of affiliated societies called lodges, now existing in all the countries of Europe, in all parts of North America, and in other parts of the world where Europeans have settled in larger or smaller communities. The order is founded on and professes the practice of social and moral virtue; truth, charity in its most extended sense, brotherly love, and mutual assistance being inculcated in its members. It possesses an elaborate ritual, or series of rituals, numerous grades of officers, and many secret signs and passwords by which members may make themselves known to other members of the craft in any part of the world. The official title of the order is Ancient Free and Accepted Masons, sometimes shortened to Free and Accepted Masons, and abbreviated A. F. & A. M. or F. & A. M. respectively. There are three principal degrees in Masonry, namely, apprentice, fellowcraft, and master mason, with appropriate ceremonies for initiation into each degree, and it is only on attaining the degree of master mason that a brother enjoys the full benefits and privileges of the craft.

Modern Freemasonry is called by mem-

bers of the craft "speculative" masonry to distinguish it from the "operative" masonry of ancient times and especially of the Middle Ages, when mason brotherhoods were organized incorporations, substantially similar to the other guilds of workmen, governed by rules of their own, and recruited from a body of apprentices who had undergone a period of probationary servitude. Fable and imagination have traced back the origin of Freemasonry to the old Roman Empire, the Pharaohs, the Temple of Solomon, or even the times of the Tower of Babel and of the Ark of Noah. But the masonic craft, or operative masonry, in reality sprang into being about the same time, and from the same set of causes, as other incorporated crafts; but a variety of circumstances combined to give it an importance and influence beyond the rest.

In the Middle Ages men skilled in the hewing and setting of stones were naturally prized in that church-building period. Their vocation necessarily involved traveling from place to place in search of employment. Wherever a great church or cathedral was built, the local masons had to be reinforced by a large influx of craftsmen from other parts; and the masons from neighboring towns and districts flocked to the spot and took part in the work, living in a camp of huts erected beside the building on which they were engaged. A master mason presided over the whole, and every tenth man was a warden having supervision over the rest. As a mason therefore must travel from place to place in quest of work, it became desirable or necessary to devise means whereby a person once a member of the fraternity might be universally accepted as such, without being required, wherever he went, to give fresh evidence of his skill, or having to undergo a renewed examination on his qualifications. In order to accomplish this end, and to enable a mason traveling to his work to claim the hospitality of his brother-masons on his way, a system of symbols was devised, in which every mason was initiated and which he was bound to keep secret. This symbolism, invented for the convenience of intercourse between members of the same craft, is the basic idea of modern Masonic symbolism. As a craft, the operative masons were under the especial protection of the church and clergy, and the epithet "free" was applied to them because they were exempted from the laws which regulated common laborers, and from various burdens which were thrown on the working classes at large, both in England and on the continent of Europe.

Modern, or so-called "speculative" Freemasonry has been described as "an innocent mystification unconnected either with the building craft or with architecture," other than "the building of a man." It is of British origin, and dates from the 17th century, with brotherly love, relief and truth as its distinguishing tenets. Charles II and William III were Masons, and the appearance of a connection with operative masonry was maintained by the election of Sir Christopher Wren, builder of St. Paul's Cathedral, to the office of grand master. Since that time, several members of the British royal family have headed the order in Britain, and the Duke of Connaught, uncle of King George V, was grand master in 1923.

The Grand Lodge of England was formed in 1717, and within twenty years organized Masonry had spread to the continent of Europe and to many British colonies, including, in 1730, those in America. Benjamin Franklin became a member of St. John's Lodge in Philadelphia in 1731. George Washington was master of a Virginia lodge, and many of the subsequent Presidents have been Masons. The total membership of the order in 1922 in the United States was 2,675,900; in Canada, 151,373; in Great Britain and Ireland, 380,000; in continental Europe, 75,000; in Latin America, 13,730; and in Australasia, 109,338.

Allied Organizations. Besides the Masonic bodies conferring the three fundamental degrees of Masonry in the United States known as blue lodges, there is a large number of allied bodies, including chapters of Royal Arch Masonry which with commanderies of Knights Templar confer additional degrees that constitute

what is known as the York rite; consistories of the Scottish rite, conferring degrees from the fourth to the 32nd, with an additional honor degree, the 33rd, conferred by election for distinguished services to the fraternity; and the Mystic Shrine, sometimes called the "playground" of Masonry, to which Knights Templar and 32nd degree Masons alone are eligible. The Order of the Eastern Star, principally composed of women, has no connection with Masonry save in the fact that only Masons or near relatives of Masons are admitted to membership. Many Masonic homes, hospitals, schools, and orphanages are maintained by the fraternity throughout the United States, in which each of the 48 states has its own Grand Lodge with independent jurisdiction.

Mason Wasp. See WASP.

Mass. See WEIGHT.

Massachusetts, one of the New England states and one of the original thirteen, is commonly known as "The Bay State," a name that derives from the three large bays which indent its coast line. The state is bounded on the north by Vermont and New Hampshire; on the east by the Atlantic Ocean; on the south by Rhode Island and Connecticut; and on the west by New York. It is small, having an area of only 8,266 square miles.

PHYSICAL FEATURES. The general slope of the state is from the northwest and west to southeast, toward the sea. In the west, the Berkshire Hills, a spur of the Green Mountains, extend down from Vermont. Saddle Mountain, 3,535 feet high, the greatest elevation in the state, is in this range. The altitude of this range diminishes toward the south. Between the Berkshire Hills and the Connecticut River the slope is south-eastward. The Connecticut Valley is a broad flood plain that begins at the northern boundary and extends down into Connecticut. There are a few isolated peaks and ridges rising from the floor of the valley, Mount Tom, the highest, reaching 1,214 feet. A high plateau begins eastward of the Connecticut. In the middle of the state it is about 1,100 feet above sea level, and slopes gradually toward the Atlantic. Nearer the ocean the land is level or gently rolling, dropping down and forming a part of Cape Cod peninsula, which extends eastward into the Atlantic for thirty-five miles and then curves sharply northward for about the same distance. Numerous important islands—Nantucket Island, Martha's Vineyard and the Elizabeth Islands—similar in character to Cape Cod peninsula, lie off the southeastern coast.

The Massachusetts coast is irregular in outline, being indented by many bays and inlets. The northern part is rocky but slopes away to low sandy beaches toward the south. The harbors at Boston and New Bedford are the most important. Massachusetts Bay, Cape Cod Bay and Buzzard's Bay, the last two connected by the Cape Cod Canal are the most important identations along the coast.

From west to east the important rivers are the Housatonic, Connecticut and Taunton. The Merrimac, in the north, is the only other considerable river in the state. The Connecticut, which traverses the state from north to south, is the largest of these; its important tributaries are the Deerfield, Westfield, Chicopee and Millers. While only a few miles of these Massachusetts rivers are navigable, they are important as generators of power; the rapids and falls that prevent navigation are important aids to manufacture, and many factories are on their banks.

THE PEOPLE. Though it is one of the smallest states of the Union, Massachusetts ranks sixth among the states in population, with 3,853,356 inhabitants in 1920. The Negro population is 45,466 and the foreign born, 1,077,534. The most numerous foreign born element comes from Ireland. As is to be expected in a state whose population is 94.8 per cent. urban, the second largest urban population among the states, there are many large cities. Seven cities exceed 100,000 inhabitants, and twelve have a population exceeding 60,000. In 1920 the density was 479.2 to a square mile; the state also ranking second in this regard.

MINERALS. Granite is the only really important mineral product of Massachusetts. The granite quarried comprises annu-

ally about 60 per cent. of the total minerals. Trap rock, clay for common bricks and for stove lining bricks, marble, feldspar and iron pyrites are also found in workable quantities.

AGRICULTURE. Massachusetts, with a small area and a preponderantly urban population, is not important agriculturally. For the most part, the soil is not fertile, and it is only by intensive cultivation that fruit and vegetables are raised in quantities sufficient to supply the cities. The cultivation of tobacco, onions and apples is somewhat important, and Massachusetts ranks second in the production of cranberries. Hay, corn, wheat, potatoes, rye, buckwheat and oats are also raised. The stock raising branch of agriculture is almost wholly confined to dairying.

FISHERIES. The fishing industry was important even in the days of the Massachusetts Bay Colony, and as early as 1633 Boston was exporting fish. The whaling ships of New Bedford were known in all the whaling grounds of the world early in the eighteenth century; whales were taken off Nantucket in 1690. But this branch of the fishing industry has declined. The state still leads the Union in the value of its fish catch, and Gloucester is known the world over as the principal center of the American fishing industry. Many other towns on the Massachusetts coast live by fishing alone. First in importance are cod and mackeral, and these are followed by halibut, hake, herring, haddock, pollack, oysters and lobsters.

MANUFACTURE. It is as a manufacturing state that Massachusetts is industrially important. Almost all the raw materials consumed are produced outside the state, however, and the bulk of the product is sold outside. Abundant water power and good transportation facilities have greatly aided the growth of the manufacturing industries. Boston, the most important center of manuafacture, produces a diversity of commondities; but for the remainder of the state most of the industries are rigidly localized. Brockton, Lynn and Haverhill produce boots and shoes; stationery and book paper of the finest quality comes from the mills of Holyoke; Waltham has one of the largest watch factories in the world. From Lawrence, one of the three highest cities after Boston in the value of its products, come woolens and worsteds; the city stands first in the United States in the manufacture of these. Fall River, New Bedford and Lowell are the centers of the cotton goods industry. Massachusetts ranks very high in the production of such other articles as machinists' tools, edge tools, cutlery, carpets, rugs, felt goods, silk, twine and cordage, foundry products, leather (other than shoe leather), hats and caps, hosiery and knit goods, bicycles and motorcycles, electrical machinery, shoe lasts, and a host of others. Besides those named, Adams, Plymouth, Clinton, Attleboro, Pittsfield, Taunton, North Adams, Webster, Chelsea, Springfield, Woburn and Peabody are important centers of manufacture.

TRANSPORTATION. The first rails laid in the United States were for the three mile long Quincy Railroad, constructed in 1826-7 for the conveyance of granite from the quarries of Quincy for the Bunker Hill Monument. This, however, was not a steam road. The first steam road was opened in 1835, running from Boston to Lowell. In 1922 the state had 2,107 miles of steam road and 2,766 miles of electric lines. The principal railroads are the Boston & Maine, Boston & Albany and New York, New Haven & Hartford. In 1914 the Cape Cod Canal was opened, thus putting Boston in closer and less dangerous communication with points south of Cape Cod. Boston is the railroad center as well as the chief port. In 1922 the state was served by twenty-two transatlantic steamship lines, besides numerous lines of coasting vessels.

INSTITUTIONS. Charitable institutions are under the control of the State Department of Public Welfare. Under the Department of Mental Diseases, there are state hospitals at Westborough, Taunton, Northampton, Danvers, Worcester, Medfield, Monson, Boston, Foxborough and Grafton; a State Colony at Gardner; the School for Feeble-Minded at Waltham; the State School at Wrentham; the Hos-

pital Cottage for Children at Baldwinville; the Boston Psychopathic Hospital and the Norfolk State Hospital for the care and treatment of inebriates and drug habitues at Pondville. Under the Department of Public Health, there are four sanatoria located at Rutland, North Reading, Lakeville and Westfield. Similar institutions are the Perkins Institution and Massachusetts School for the Blind at Boston and several schools for deaf.

Corrective institutions are under the direction of the state department of correction. The state prison is at Boston, the prison camp and hospital at Rutland, and the state farm at Bridgewater. The Massachusetts Reformatory for Women is at Sherborn.

EDUCATION. As an educational center Massachusetts has always taken high rank. The primary and secondary schools are entirely modern and fully adequate. The first normal schools in the United States were established in The Bay State, as well as the first free school and the first college. That it has, in educational matters, been consistent with the enviable beginning is attested by the fact that in 1920 the illiterates among the native born white inhabitants comprised but 0.4 per cent of the total. A state law requires each city containing 500 families to maintain a high school.

The following is a list of the higher and special educational institutions, which will be found described under their titles: Harvard University, 1636, the oldest college in the western hemisphere; Williams College, 1793; Massachusetts College of Pharmacy, 1823; Amherst College, 1825; Mount Holyoke College, 1837; College of the Holy Cross, 1843; Tufts College, 1850; Massachusetts Institute of Technology, 1861; Boston College, 1863; State Agricultural College, 1863; Worcester Polytechnic, 1865; Boston University, 1869; Wellesley College, 1870; Smith College, 1871; Radcliffe College, 1882; Clark University, 1887; Massachusetts College of Osteopathy, 1897; Simmons College, 1902; Jackson College, 1910; Wheaton College, 1834; Northeastern College, 1916; Gordon Bible College, 1916; Emmanuel College, 1919; and Assumption College, 1904.

GOVERNMENT. The constitution of Massachusetts was adopted in 1780. It provides for a legislature (general court) divided into two houses, upper and lower, of 40 and 240 members respectively; legislators are elected annually.

The chief executive is the governor, who is advised and assisted by a council of eight. Other executives are the lieutenant-governor, secretary of state, attorney-general, treasurer, auditor and receiver-general. All executives are elected for one year.

The judiciary consists of a supreme court, superior court, probate courts and courts of solvency. All of the justices hold office on appointment by the governor.

HISTORY. It is supposed that the Norsemen visited the Massachusetts coast in the eleventh century, and it is well established that it was explored by Bartholomew Gosnold in 1602 and by John Smith in 1614. The first colony was established in 1620, at Plymouth (which see). The Massachusetts Bay Colony, securing a royal charter in 1629, grew up in the vicinity of Salem. This and Plymouth Colony were united in 1692. Religious intolerance caused Salem (see Salem) to go through a period of great internal struggle, and the colony was almost constantly at war with the red men. Massachusetts was the leader of the opposition to British rule in the colonies, and its soil was stained with the first blood shed in the Revoluionary War. Massachusetts opposed the War in 1812, but took a full part after that war opened.

Slavery was forbidden by the constitution, and the state was virtually the home of the abolitionist movement. The first number of Garrison's *Liberator* was published in Boston in 1831. The state contributed heavily in men, money and ships to the Union cause. See GARRISON, WILLIAM LLOYD; BOSTON TEA PARTY; PILGRIM; STAMP ACT.

STATISTICS. The following are the latest reliable statistics available:

Land area, square miles	8,039
Water area, square miles	227
Forest area, acres	3,000,000
Population (1920)	3,852,356

White	3,803,524
Negro	45,466
Asiatic	2,811
Foreign born	1,077,534
Chief cities:	
Boston	748,060
Worcester	179,754
Springfield	129,614
New Bedford	121,217
Fall River	120,485
Lowell	112,759
Cambridge	109,694
Lynn	99,148
Lawrence	94,270
Somerville	93,091
Brockton	66,254
Holyoke	60,203
Number of counties	14
Members of state senate	40
Members of house of representatives	240
Salary of governor	$10,000
Representatives in Congress	18
Assessed valuation of property	$8,104,332,601
Bonded indebtedness	$138,049,134
Farm area, acres	2,494,477
Improved land, acres	908,834
Potatoes, bushels	3,335,000
Corn, bushels	3,120,000
Tobacco, pounds	13,700,000
Hay, tons	529,000
Wool, pounds	131,000
Domestic Animals:	
Horses	47,000
Milk cows	157,000
Other cattle	100,000
Sheep	28,000
Swine	130,000
Manufacturing establishments	11,906
Capital invested	$2,962,108,527
Operatives	713,836
Raw material used	$2,260,713,036
Output of manufactures	$4,011,181,532
Boots and shoes value	$442,466,236
Foundry and machine shop products, value	$256,618,166
Electrical machinery and supplies, value	$91,938,738
Paper and woodpulp, value	$87,159,890
Leather products, value	$129,249,131
Packing house products, value	$110,238,038
Miles of railway	2,107
Teachers in public schools	24,875
Pupils enrolled	731,442

Massachusetts Bay Colony, the name generally applied to the colony founded in 1628 at Salem by the Puritans under John Endicott. These colonists were enamored of religious freedom, but they tolerated no members of other sects in their settlement. For a time they governed themselves independently of the English king, and in consequence lost their charter in 1648. In 1691 a new charter was granted them, and under this they were governed until the time of the Revolution.

In this colony the first system of free public instruction was established; and Harvard, the first institution of higher learning in America, was founded here. See SALEM; WITCHCRAFT.

Massage, ma-säzh′, in therapeutics, the art of manipulating the muscles and tissues of the patient. The word is from the Greek verb meaning to knead. The purpose of massage is to strengthen the muscles and to improve the circulation, stimulate the action of the secretory and excretory organs, and to invigorate the entire system. The process includes stroking, kneading, friction, and percussion. Massage in some form was in use at an early period by the Chinese, the ancient Egyptians, the Greeks, the Romans, and many other nations. Even savages make use of it in a crude form. Massage is associated with the Swedish movement-cure of Ling, and with the osteopathy of Dr. Still, but is a much more general term than either, and involves no special theory of disease. In 1877 Dr. S. Weir Mitchell, of Philadelphia, advocated the application of massage in certain disorders, and did much to extend its use among practitioners of the regular schools of medicine. It is considered at present a valuable means of cure if properly applied, but capable of doing injury if used indiscreetly. See OSTEOPATHY.

Massasoit, măs′a-soit, (1580-1661), chief of the Wampanoag Indians. This tribe had at one time numbered thirty thousand, but had been reduced to three hundred by fever about the time of the founding of Plymouth. Massasoit with sixty of his warriors in Indian military form, appeared before Governor Carver proposing a treaty of peace. So friendly, so dignified and sincere did the chief appear in his greeting, that the governor concluded a treaty with him which was sacredly kept for fifty years.

Massasoit was just, kind, hospitable, and ever sought to imbue his people with a love of peace. His home was near the present town of Bristol, Rhode Island. At his

death, his son, known to the colonists as King Philip, assumed control of the tribe and later the encroachments of the whites led to the bloody King Philip's war.

Massenet, Jules Emile Frederic (1842-1912), a French operatic composer, was born in Montaud. He was educated at the Paris Conservatory, where he won prizes for pianoforte playing and for fugue writing. In 1878 he was made professor of advanced composition at the Conservatory, holding that position until 1896. Also in 1878 he was elected to the Academie des Beaux Arts. M. Massenet's instrumentation is particularly fine, and he is a master of dainty and bizarre effects, and his melodies are always charmingly fluent. But he is considered by many authorities to lack real depth, without which a composer is not entitled to the same notice as one whose depth of feeling is undoubted. Among M. Massenet's important works are *Le Jongleur de Notre Dame, Le Cid, Manon Lescaut, Herodias, Don Cesar de Bazan, Amadis, Thais, Don Quichotte* and *Cleopatre.*

Massillon, măs'si-lŏn, **Jean Baptiste** (1663-1742), a distinguished French clergyman. He has been styled the Racine of the French pulpit, and is said by some to have been the greatest pulpit orator of France. During the latter years of Louis XIV, Massillon was the court preacher. At the time of his advancement at court, the aged king had already turned from a dissolute life to a life of asceticism. He is said to have declared that other preachers made him "pleased with them, but that Massillon made him displeased with himself." He was elected a member of the French academy. The last twenty years of his life were spent in retirement as Bishop of Clermont. His collected words, chiefly sermons, were published in twelve volumes.

Massillon, Ohio, an industrial city, is on the Tuscarawas River, on the Ohio Canal, and on several railroads, 100 miles northeast of Columbus. It is in a region of rich farm lands, valuable coal fields, and iron and sandstone deposits. The manufactures are varied, including sheet and structural steel, flour, aluminum, steel tubing, furnaces, paper, bricks, enameled ware, agricultural implements and rubber goods. Massillon contains the state hospital for the insane, McClymond's library, good public schools and several parks. The population in 1920 was 17,428.

Massinger, mas'in-jer, **Philip** (1583-1640), an English dramatist. He was educated at Oxford but left without taking a degree. In 1606 he went to London, where he soon became a well known playwright. He wrote about fifteen plays independently and many others in collaboration with Field, Dekker, Fletcher, and other writers. Among his plays may be mentioned, *The Virgin Martyr, The City Madame, The Duke of Milan,* and *A New Way to Pay Old Debts.* In England the last named play kept the stage for 150 years.

The main character of the play, Sir Giles Overreach, is undoubtedly a caricature on the notorious Sir Giles Nompesson, whose extortive actions were well-known at the time.

Masters, Edgar Lee (1869-), an American lawyer and poet who came into prominence upon the publication of his *Spoon River Anthology* in 1915. He was born at Garnett, Kans., educated at Knox College, and was admitted to the bar in 1891. Mr. Masters' first literary offering was *A Book of Verses,* published in 1898. He later published a blank verse drama, *Maximilian,* and *The New Star Chamber and Other Essays,* and the plays *Althea,* and *The Trifler.* Upon the *Spoon River Anthology,* however, his reputation as a literary artist rests. This volume is a collection of poems in free verse. Each poem is a frank post-mortem statement, brief but complete, by some member of the dead community in the rural burial ground of Spoon River. Both the content and the manner are unusual, but the realism of the speakers' stories is belied by nothing save the epitaphs on their headstones. Mr. Masters is an able delineator of character, and while the ANTHOLOGY has been decided by some as being too grim, yet there are flashes of fine humor and an occasional bit of genuine tenderness. Later works by Mr. Masters are *The Great Valley, Toward the Gulf, Starved Rock, Mitch Miller, Open Sea* and *Skeeters Kirby.*

Master in Chancery, an officer of a court of equity or chancery appointed to assist the judge. The office is one of the oldest in court annals, but it has been abolished in England, the duties formerly imposed on the masters now being discharged by the judges or by the registrars and masters of the Supreme Court.

Masters in chancery still exist in the United States under the title of *master* or *commissioner*.. Cases are frequently referred to them for hearing, particularly those cases in which the examination of accounts and computations are required. A master may be appointed to examine witnesses, to take depositions, and to investigate the facts pertaining to a case and report to the judge.

In the early history of the office the masters were associates and assistants of the judge. Later they were clerks in chancery.

Mastic, a fragrant, resinous gum obtained from an evergreen shrub of the Mediterranean region. Cultivation for commercial purposes is confined to the Greek Island of Scio. The shrub is from six to fifteen feet high. It grows on stony land, requiring much the same care as the olive. In midsummer vertical incisions are made in the bark. The resin oozes out and hardens in oval-shaped tears the size of peas. Every fifteen days the mastic is collected by women and children who carry little baskets lined with white paper. A thrifty shrub yields several pounds of mastic in a single season. During the fifteenth, sixteenth, and seventeenth centuries mastic had a high reputation as a remedy, but it is no longer used in compounding medicines. Dissolved in turpentine it makes an excellent varnish for maps, paintings, etc. The sale of mastic forms the chief revenue of Scio. The principal customers are the Turks. Turkish women of all classes use it as a chewing gum. See GUM; VARNISH.

Mastiff. See DOG.

Mastodon, an extinct member of the elephant family, closely related to the mammoth. It is known only from skeletons. A very nearly perfect skeleton was found in Missouri in 1840. It is now preserved in the British Museum. The dimensions are as follows: Length, 20 feet 2 inches; height, 9 feet 6 inches; length of head, 3 feet 6 inches; width of foot, 2 feet 11 inches; length of trunk, 7 feet 2 inches; circumference of trunk at base, 27 inches Another fine skeleton, found at Cohoes, New York, in 1866, is now preserved in the State Museum of Natural Hisory at Albany. Scientists are unable to account for the extinction of this huge animal. It appears to have roamed the valleys of Europe, and especially those of North America, in large herds. It was too large to be destroyed by other animals, and there is no evidence that its food supply gave out. Some of the skeletons are so perfect that remnants of grass, herbs, and leaves have been found in the stomach. See MAMMOTH; ELEPHANT.

Matanzas, Cuba, the capital of the province of the same name, is on the Bay of Matanzas on the north coast of the island, 44 miles east of Havana. Two rivers, the San Juan and Yumuri, divide the city into three sections—industrial, commercial and residential. Matanzas ranks next to Havana as a railroad and commercial center. The exports are chiefly sugar, molasses and rum. There are many factories, producing leather, shoes, rum, refined petroleum, cordage, guava jelly, cars, machine shops and foundry products, tobacco products and other articles.

Matanzas was founded in 1693 and has had a slow but steady growth. In or near the city are the Plaza de la Liberdad, Fort San Severino, Monserrat Chapel, San Estaban Theater and the caves of Bellamar, which contain a great variety of beautiful and curious stalagmites and stalactites. The streets of Matanzas are wide, well paved and electrically lighted. The climate is tropical but very healthful. In 1919 the population was 41,574, decreasing from 65,468 in 1916.

Matches, small splints of wood coated at one end with chemicals easily set on fire. The first matches were made by dipping one end in sulphur or brimstone. These brimstone matches were lighted by sparks made by striking steel and flint together, and caught in tinder or dry linen scraped fine like lint. The first improve-

ment was a match dipped chiefly in potash and ignited by sulphuric acid carried in a bottle for the purpose. About 1829 an English chemist announced the invention of lucifer matches, coated chiefly with sulphur and phosphorus, and ignited by rubbing on any dry, gritty surface. Before the invention of matches it was necessary to keep fire over night by covering up coals with ashes. In case the fire went out live coals must be brought from a neighbor's, even miles away.

As late as 1860 matches were made in blocks the size of a match box and were split not quite apart. The heads were so inflammable that in detaching one match or in rubbing the palm of the hand carelessly across the heads the entire box was set on fire not infrequently, and was a total loss.

Safety matches are made by coating the match with one chemical and coating a striking surface with the other chemical required to produce a fire. Matches may be dipped in potash, for instance, and carried in a box on which a strip of sandpaper has been coated with phosphorus. The matches cannot be set on fire without rubbing the potash end on the phosphorus. We import about $150,000 worth of safety matches a year from Sweden.

In France, the making of matches is carried on by the government at an annual profit of $4,000,000. The Japanese are experts in the manufacture of matches. They supply the entire Chinese empire, the latter having no suitable wood for the purpose. Civilization uses 3,000,000 matches a minute. 50,000 matches crackle every second. Americans use as many matches as all the rest of the world put together.

American matches are made of clear white pine. A match factory is a large establishment employing many people. The pine must be of the best quality. It is first sawed into heavy plank and is piled in yards to season thoroughly. When dry the planks are cut into match lengths and all knots are discarded. The blocks are fed to the machine by placing them on end on a conveyor. The blocks come under a set of forty-eight circular knives that rise and fall like the tick of a watch—four times to the second. Each time the knives descend forty-eight splints are gouged off. Each time the knives rise forty-eight splints, still upright, are forced an eighth of an inch up into as many holes in a flat steel link. An examination of a match shows that one end has been squeezed into a hole. The steel links form an endless chain that carries the splints in groups on a long journey. First they pass through a bath of paraffin to make the wood catch fire readily. Next the ends of the splints pass over rollers that elevate chlorate of potash from a reservoir, and, after the chain has traveled a while to dry the potash, the splints, still standing like bristles in a brush, rub across a second set of rollers that apply the phosphorus that ignites with friction. Finally, over half an hour after the splints were thrust into the link, they are punched out by a set of pins and fall on a belt that carries them to packing tables. Here girls with nimble fingers fill the boxes, wrap and pack for market. Two men are able to operate two machines and look after all the belts, carriers, and baths. With the aid of five packers they turn out 24,000 matches a minute, or, if there be no stop or miscarriage, 14,400,000 matches in a day of ten hours, or about enough to last the country five hours.

In another process of manufacture, the match-making machine has a traveling metal band or conveyor, about 700 feet in length, which takes a serpentine course in its journey with the little splints of wood that finally emerge as matches. The time taken is regulated to provide that the matches shall be thoroughly dry when they reach the boxes, after receiving the various chemical treatments; for this machine packs as well as makes the matches. When the flexible band arrives at the finishing point, the matches protruding from its surface are punched out as before, but fall into the inside boxes in which they are sold, instead of being packed therein by hand. These boxes are so placed as to catch them as they fall from the conveyor, and are kept shaking so that the matches fill them completely, with the heads all in one direction. When full, a steel arm presses the inside boxes into their covers, and they pass along a trough in dozens, to be quickly wrapped in paper and sealed by another machine. Human hands then take up the

task, and the packages of one-dozen boxes are gathered into larger packages of one gross, in which form they reach the retail stores.

Ingenious machines are used for making the familiar boxes in which matches are packed. A large section of tree trunk, usually aspen, is stripped of its outer surface in a peeling machine, and then cut into thin rolls, or veneered. At the same time the rolls are scored ready for folding by the boxmaking machine. The wood is then cut into skillets, or pieces of the size required for inside boxes or covers, and the ends are dyed pink, where they will show outside of the paper labels. Box machines fold the skillets to their final shape, label them, and after being dried they are ready to receive the matches. Several thousand gross of boxes are thus turned out in one factory in a day.

Legislation in recent years has eliminated the old white-phosphorus match, with its danger of fire and poisonous nature. Their manufacture could not be prohibited by law, under constitutional limitations, but a tax of ten cents a box was placed on them, and this effectually stopped their production.

Matches are now also made of paper, and put up in light cardboard containers with an ignition surface. The chemical treatment is similar to that in making matches of wood, and they are found convenient by many people for carrying in the pocket. But the matches most in demand in the United States are boxed wooden matches, of the sizes and types known respectively as "parlor" and safety matches.

In 1920 there were 21 match factories in the United States, employing 3,726 people, and turning raw materials valued at about $7,000,000 into matches worth at wholesale $18,500,000, a large proportion of which retail at a cent a box.

Mate, mah'tay, or **Paraguay Tea,** a small tree or large shrub of the holly family raised in Paraguay, Brazil, and elsewhere in South America; the leaves which are brewed in the usual way being much used in place of tea. The drink is highly prized by South Americans, though usually nauseating to others, and is drunk by the unique method of sucking it through a tube having a strainer at the end which is placed in the vessel.

Materia Medica, the Latin for medical matter, or that branch of medical science which treats of drugs, their origin, classification, preparation, purification, their action on the animal economy, and the mode of administering them for the relief or cure of disease. Partly through experience and partly by means of experiment on the lower animals, a general classification of medicines as to their action on the tissues of the human economy, has been evolved; for instance, alteratives, tonics, stimulants, astringents, cathartics, etc. The above may be grouped under four general sections as follows: 1. Those having a special action on the brain, spinal cord and general nervous system. 2. Those having a special action on the secretions. 3. Those which affect the blood. 4. Those which act locally when applied to the surface of the body.

Materialism. See PHILOSOPHY.

Mather, Cotton (1663-1728), the son of Increase Mather, was named for his two grandfathers, John Cotton and Richard Mather. He was graduated from Harvard at the age of fifteen, the course then offering less science, mathematics, and history than an ordinary high school of the present day. He became his father's associate and successor. He was a man of prodigious learning. He wrote many works, branching out into French, Spanish, and Algonquin. A list of his writings, now forgotten, includes 382 titles. He carried on a correspondence with the learned men of Great Britain. He was made a D. D. by the University of Glasgow. He was elected a fellow of the Royal Society of London, the first American to receive the honor. He was ambitious to become the president of Harvard, but the honor did not come to him. In some respects he was a progressive man, and yet he was superstitious. He ran the risk of mob violence in the advocacy of inoculation for smallpox—the first experiment of the kind in Boston, and yet he was in the forefront of the trials for witchcraft and acquiesced in the execution of a score of reputed witches. Subsequently, however, he appears to have been

ashamed of his part in the matter. He was much irritated by a weaver who called attention in print to his credulity. Mather called the weaver a "coal from hell" and prosecuted him for slander, but thought it wise not to bring the suit to trial.

When Franklin revisited Boston, he called on Cotton Mather, not only as the leading clergyman of Boston, but the American best known abroad. He related the following incident illustrative of the Mathers' custom of touching on some religious or moral truth on every occasion.

> He received me in his library; and, on my taking leave, showed me a shorter way out of the house through a narrow passage which was crossed by a beam overhead. We were still talking as I withdrew, he accompanying me behind, and I turning partly toward him, when he said hastily: "Stoop! stoop!" I did not understand until I felt my head hit against the beam. He was a man that never missed an occasion of giving instruction, and upon this he said to me: "You are young, and have the world before you; stoop as you go through, and you will escape many hard thumps." This advice, thus beat into my head, has frequently been of use to me, and I often think of it when I see pride mortified and misfortune brought upon people by carrying their heads too high.

See WITCHCRAFT.

Mather, Increase (1639-1723), the son of Richard Mather. He was born at Dorchester. He was graduated at Harvard in 1656 and was sent to Trinity College, Dublin, where he again received a degree in 1658. During the remaining days of the Commonwealth he preached in Devonshire and Guernsey. On the restoration of the Stuarts he preferred to return to America rather than conform to the rules of the Church of England. On his arrival he was invited to the pastorate of the North Church, Boston, a position he held for over sixty years. He was a laborious writer. He committed his sermons to memory. He served as acting president of Harvard for many years and would have been made president, but for the reluctance of his church to release him. He received the first degree of D. D. granted by Harvard. He was sent to England in 1688 to ask William and Mary for a new charter in lieu of the former charter revoked by Charles II. The court of Massachusetts appointed a day of Thanksgiving for his safe return and the success of his mission. Although his income was small, he devoted one-tenth, the Scriptural tithe, to religious and charitable purposes. He spent sixteen hours a day in his study. A list of his writings includes nearly a hundred titles. He believed in witchcraft, but was not in sympathy with the persecution of reputed witches.

Mather, Richard (1596-1669), a native of Lancashire, England, a district rampant with independent thinking and noted for Lollardism. He was a schoolmaster near Liverpool and was educated at Oxford for the Church of England. He was installed as pastor in the village where he had taught. In 1633 he was silenced for failure to observe the ceremonies required by the ritual. He emigrated to Boston in 1635 and next year became pastor of the Dorchester Church, a position he held till his death. He assisted in the compilation of the *Bay Psalm Book,* and of a book of discipline known as the *Cambridge Platform.* His *Journal* was issued by the Dorchester Historical Society in 1850.

Mathew, Theobald (1790-1856), the Irish "Apostle of Temperance." He was born in the county of Tipperary and was educated at Kilkenny, Maynooth, and Dublin. He entered an order of monks, the Capuchins, and joined the mission at Cork. He was a man of piety and simple eloquence. In 1838 he began the establishment of total abstinence societies. The movement spread rapidly to Limerick, Galway, and other Irish towns. Seventy thousand inhabitants of Dublin signed the pledge in five days. The government revenue from duties on liquors imported into Ireland fell off $3,000,000 in five years. In 1844 he visited Liverpool, Manchester, London, and other centers of workingmen, meeting everywhere with success. His good work for Ireland was neutralized in part by the potato famine. In 1849-51 he visited the United States, where Father Mathew societies still attest the respect in which his name is held. Queen Victoria granted him a pension in his old age. He died at Queenstown.

Matter, as defined in physics, anything which occupies space. It is the medium through which energy is manifested, and,

with energy, is the subject matter of physics. Matter is that of which the universe external to our minds is composed. Our knowledge of it can be gained only through our senses; knowledge of it, then, is in our consciousness only; whence it may be questioned whether matter has any objective reality at all and whether, if it has, we can ever really know anything about it. However that may be, in physics, as well as in common life, we may consider it as existent without serious consequences.

A body is a portion of matter; volume is the space it occupies; substance is a kind of matter; while the word mass denotes the quantity of matter in a body. The tendency of matter to resist forces tending to change its condition of rest or motion is called inertia and is proportional to the mass. So far as is known, matter can neither be created nor destroyed, which statement is called the law of conservation of matter. A singular attribute of matter is its gravitative action, every portion attracting every other. The force of this attraction between two bodies is proportional to the product of their masses and inversely proportionate to the square of the distance between their centers.

Matter exists in three (possibly four) states: solids, which retain their shapes; liquids which retain their volume, but need lateral support; and gases, which keep neither shape nor volume unless wholly confined. The last two, because they flow, are called fluids. A highly rarefied gas exhibits characteristics which justify its being considered a fourth state.

Matterhorn, mät'ter-hörn, **Mount,** a famous mountain of the Alps on the boundary between the canton of Valais, Switzerland, and Piedmont, Italy. The peak forms an immense rocky horn very difficult of ascent, and is one of the most magnificent objects in nature, being only 1,000 feet lower than Mt. Blanc. Its summit at a height of 14,837 feet has been reached by Lord Douglas, Hudson, and others.

Matthew, Saint, was the son of Alpheus, and is the publican whom Mark and Luke call **Levi.** He was a publican, probably of the subordinate class whose duty it was to gather taxes in a limited district. It is recorded that after Matthew was called to follow Christ he gave a feast in the Savior's honor to which a multitude of other publicans were invited as guests. Matthew is mentioned once in the *Acts of the Apostles.* He is supposed, however, to have spent several years preaching in Jerusalem. In some non-Scriptural accounts of Matthew it is said that he was one of the few Apostles who died natural deaths, while in other accounts he is said to have suffered martyrdom. Matthew is accepted as the author of the Gospel according to Saint Matthew, the first book of the New Testament.

Matthews, (James) Brander (1852-), an American educator, essayist, and dramatic critic, was born in New Orleans, La. He was graduated from Columbia College in 1871, and from Columbia Law School in 1873, but forsook the legal for a literary career. From 1892 to 1900 Mr. Matthews was professor of literature at Columbia University, and has been professor of dramatic literature there since 1900. Mr. Matthews first became known to the literary world for his published dramatic criticisms. Later, however, he published short stories, miscellaneous essays, studies in literature, and a novel. He is also the author of several comedies. Mr. Matthews was one of the founders of the Authors' Club and of the Players' Club, and was one of the organizers of the American Copyright League. Among his works are *The Theatres of Paris, Franch Dramatists of the Nineteenth Century, An Introduction to the Study of American Literature, Essays on English, Principles of Playmaking, A Secret of the Sea and Other Stories* and *His Father's Son.* His comedies include *Margery's Lovers, On Probation* and *The Decision of the Court.*

Mattoon, Ill., an industrial city, is 170 miles south of Chicago and almost equidistant between Indianapolis and St. Louis, being 128 miles west of the former and 124 miles east of the latter. The city is located on the main lines of the Illinois Central and Cleveland, Cincinnati, Chicago & St. Louis (Big Four) railroads. Both railroads have extensive repair shops here.

Mattoon's factories produce brooms, flour, shoes, engines, water works supplies, etc. The city is located in the center of an exceedingly productive agricultural district which produces grain, fruit, live stock and broom-corn.

The most notable public buildings are the Federal building, the Carnegie library, Methodist Memorial Hospital, Old Folks Home of the I. O. O. F., the high school and seven grade schools, six of the latter being new, modern buildings. The 1920 census figures give the city a population of 13,552. This is exclusive of several hundred who live just outside the city limits.

Mauna Loa (in the Hawaiian, Long Mountain) is the largest active volcano in the world, though it is not the highest. It occupies much of the south-central part of Hawaii, sloping up from the sea to the summit, 13,760 feet high, near the center of the island. The crater, which is constantly active, sending up clouds of smoke and gaseous vapors, is one and one-half miles in diameter and is variously estimated at from 500 to 1,000 feet deep. Mauna Loa breaks into excessive activity about once every ten years. In 1916 this volcano was incorporated into the Hawaii National Park.

Mauna Kea (in the Hawaiian language, White Mountain), is an extinct volcano and is also the highest peak in the Pacific islands. Mauna Kea is 13,820 feet high, and is usually snow crowned; the latter fact accounts for its name. This mountain occupies the northern port of Hawaii. The top is a barren waste of lava; farther down it is heavily forested; and on the lower slopes coffee and sugar cane are cultivated.

Maupassant, mō-pä-sän′, **Henri René Albert Guy de** (1850-1893), a French novelist. As a young man De Maupassant was a navy department clerk and also served in the army. His godfather was Flaubert, a novelist, who gave him careful training in the art of composition. He published nothing until he was thirty years old, having meanwhile produced and destroyed a large number of manuscripts. His first publication was *A Piece of String,* a short story whose most striking characteristic is the realistic manner in which a trifling incident is made responsible for a man's ruin and death. The story wins admiration for its execution. It is not pleasing, nor instructive, nor inspiring, nor beautiful. De Maupassant produced six novels, of which *Pierre et Jean* is the best. Of his many short stories *The Necklace* is mentioned with *A Piece of String* as representative of the author's peculiar ability. Both stories are finished with the utmost care, both are realistic, and both treat of important results from insignificant occurrences. In *A Piece of String,* however, the chief character, although he knows the truth, allows himself to succumb to the opinion of those who are deceived; while in *The Necklace* the commonplace heroine is herself deceived, but sacrifices years of her life to be true to her own ideas of honesty. The discovery that her sacrifice has been needless is a powerful picture of the irony of fate, but we may at least admire the woman's strong adherence to principle. De Maupassant's later works show signs of the mental disease which resulted in insanity two years before his death. Almost all of his short stories have been published in English under various titles.

Mauritius, mau-rĭsh′ĭ-ŭs, an island in the Indian Ocean 500 miles east of Madagascar. It was named in 1598 by a Dutch captain in honor of Prince Maurice. Since 1810 it has belonged to England. Area, 705 square miles. Population, including French settlers, negroes, and coolies, 378,000; or 526 to the square mile. It is practically one immense aloe, sugar-cane, cotton, and indigo plantation. Some $15,000,000 worth of sugar is exported yearly. The planters and merchants are wealthy. They have nine daily papers, two railroads, telephones, telegraph lines, and markets supplied from all quarters of the globe. Fruits and cocoanuts are abundant. The dodo, a clumsy bird, once lived here but is now extinct, as is also a huge land tortoise. Monkeys, deer, and hares have been introduced. A fruit-eating bat is the only native mammal on the island. See Dodo.

Maury, Matthew Fontaine (1806-1873), an American geographer. He was a native of Virginia. He entered the United States navy in 1825. On a trip

around the world in the United States frigate Vincennes he wrote the greater part of a textbook on navigation still in use. In 1839 he was lamed by an accident and was detailed to the hydrographical office at Washington, with the rank of lieutenant. In matters pertaining to the ocean he was the foremost student of the day. He wrote a *Physical Geography of the Sea,* special treatises on the Gulf Stream, ocean currents, great circle sailing, a series of geographical textbooks for common schools, and a series of sailing charts for mariners. He was instrumental in calling a maritime conference at Brussels. At the outbreak of the Civil War he sacrificed the advantage of his position, joined the Confederates, and drifted finally into the service of the ill-fated Maximilian of Mexico. His later days were passed at Virginia Military Institute as professor of physics. See GEOGRAPHY.

Mausoleum, any splendid tomb of large size. The term is derived from a magnificent marble edifice erected at Halicarnassus about 350 B. C. by Queen Artemisia as a place of burial for her husband Mausolus, king of Caria. It ranked as one of the seven wonders of the world. It was destroyed by an earthquake, probably during the thirteenth century. Excavations were conducted during the nineteenth century. The foundation was found to be 128 feet by 100 feet in area. Fragments of sculptured lions, dogs, horses, pillars, and friezes representing Greeks fighting with Amazons have been removed to the British Museum. A basement sixty-five feet in height was surmounted by an Ionic colonnade twenty-three and one-half feet high. Above this was a pyramid rising by steps. At the apex were colossal figures of Mausolus and Artemisia, fourteen feet high, riding in a four-horse chariot. The mausoleum of the Emperor Hadrian at Rome is known as the Castle of San Angelo. The famous pyramids of Egypt were built as mausoleums. See BERLIN; NAPOLEON; GRANT; GARFIELD; TAJ MAHAL.

Mavor, James (1854-1925), Canada's foremost economist and an able educator, was born at Stranraex, Scotland, and educated at the University of Glasgow. After graduation he was assistant editor of a technical journal, professor of political economy and statistics at St. Mungo's College, Glasgow, and editor of the *Scottish Art Review.* He also engaged in university extension work. In 1892 he removed to Canada and was appointed to the chair of political economy at Toronto University.

Besides his work at the university, Dr. Mavor, under appointment by the British Board of Trade and the Dominion government, made exhaustive investigations of labor conditions, railway rates, immigration, transportation, grain production, copyright and a number of other social and economic subjects. In his prosecution of these investigations Dr. Mavor rendered invaluable service to Canada and the empire. In making these researches he traveled extensively in America, Europe and the Far East. Among his many publications are: *Economic Study and Public and Private Charity, Railway Transportation in America, A Short Economic History of Canada, Report to British Board of Trade on the Northwest of Canada, Wage Theories and Statistics, Economics, Taxation in Ontario* and *Handbook of Canada.*

Maxim, Sir Hiram Stevens (1840-1916); American inventor and engineer. He was apprenticed to a carriage maker in his youth and spent several years in a machine shop in Fitchburg, Massachusetts, where he perfected his knowledge of mechanical engineering and drawing and added to his scanty education. He then went to Boston as foreman in a factory making philosophical apparatus, and later worked in New York. Because of the alleged unfairness of the United States government toward him, Maxim became an English subject and in 1901 was knighted by Queen Victoria. Among his many inventions and patents are an automatic gas machine, an incandescent electric light, and a process for flashing electric carbons.

Maxim, Hudson (1853-1927), American inventor and engineer, educated with special reference to the natural sciences and engineering. He devised a process for printing in colors and was the first to manufacture smokeless gunpowder

in the United States. He also invented the high explosive maximite, used by the United States government, and the automobile torpedo bearing his name.

Maximilian (1832-1867), archduke of Austria and emperor of Mexico. He was born at Vienna, July 6. His wife was Carlotta, daughter of Leopold I and sister of Leopold II. She was born in 1841. In 1863 while the authorities of the United States were too busy with civil war to insist upon the observance of the Monroe Doctrine, Napoleon III of France, in imitation of Napoleon I, interfered in the affairs of Mexico. Under pretense of collecting debts due French creditors, he landed French troops to cöoperate with the Mexican clergy, who were opposed to President Juarez. Juarez was driven from the capital and an empire was declared. Napoleon offered the throne to Maximilian, who accepted and ruled for a time. At the close of the Civil War President Johnson insisted upon the withdrawal of French troops from American soil. Juarez then got the upper hand. Carlotta went to Europe to seek aid. France refused and the Pope could do nothing. Maximilian, deceived in the amount of aid to be expected from the natives, held out when he might have fled to safety. He was betrayed into the hands of Juarez by a Mexican general named Lopez and was tried by court-martial and shot July 19. Upon hearing of his death Carlotta lost her reason and remained mentally unsound to the day of her death, January 17, 1927.

In his autobiography General Phil Sheridan states that secret assistance was given the Mexicans by the United States authorities. At one time 30,000 muskets were sent from the arsenal at Baton Rouge to the liberals under Juarez.

See JUAREZ.

Maximilian I (1459-1519), emperor of Germany. He was the grandfather and predecessor of Charles V. He laid the foundation for the extensive German territory inherited by that monarch. He was involved in wars with the Hungarians, Turks, Swiss, Venetians, and French. He established the first German standing army and put an end to petty wars between his vassals. He was a man of chivalrous ideas, a promoter of arts and sciences—the greatest of the Maximilians.

Maxwell, James Clerk (1831-1879), Scottish natural philosopher; he was educated at Edinburgh and at Trinity College, Cambridge. He held the professorship of natural philosophy in the Marischal College, Aberdeen, until it became a part of the University of Aberdeen in 1860, when he was appointed to a similar chair in King's College, London. Later he became a Fellow of the Royal Society, and professor of experimental physics at Cambridge. Maxwell's fame rests on the fact that he was the first to take the grand step toward the discovery of the true nature of electrical phenomena, explaining all such as the result of local strains and motions in a medium whose contiguous parts act on another by pressure and tension.

May, the fifth month of the year. It was the third month of the Roman year. The month was named for Maia, the mother of Mercury, originally the goddess of growth or increase. The word is akin, no doubt, to the Latin *magna,* great.

In literature, May is the month of flowers. As far east as India the first of May has been a gala day ever since the dawn of history. The Romans celebrated the festival of the flowers on the first of May. The young people of Italy still sally forth at daybreak to gather boughs with which to decorate the doors of their friends.

In England, May Day has been a festival of dance and flowers from time immemorial. The hawthorn is called the May-bush. May Day was looked forward to by the village young people in much the same way that our young folks anticipate the Fourth of July. At sunrise fresh flowers and hawthorn boughs were brought home with blowing of horns and merry-making. The fairest maid in the village was crowned with a wreath of flowers and placed in a little bower or arbor, where she held her little court, receiving the homage of her companions. In lieu of the American flagpole, every village green had a Maypole. May Day morning wreaths of flowers were hung on it, and the young people danced about it on the turf. The Puritans of

Cromwell's day were much opposed to pleasures of this sort. They ordered the Maypoles cut down, and for some years were able to put a stop to Maydaying. On the return of the Stuarts the good old May Day customs were revived. Tennyson has described these May Day pleasures in his *May Queen*.

May Beetle, or **June Bug,** a large beetle common in the central and southern part of the United States. When these beetles are full grown they do serious damage to the foliage of fruit and shade trees by feeding on the leaves. They swarm in great numbers after dark, especially during the months of May and June. When numerous, the larvae, in the form of large white grubs with a brown head, are destructive to the sod of lawns and meadows and to small garden plants, since they cut off the roots just below the soil. They work havoc also with small ripe fruit, especially raspberries and blackberries.

The best exterminator is an emulsion of kerosene washed into the ground, for the larvae, and for the adults, cans of kerosene placed near lights to attract them. Paris green sprinkled over heaps of decayed fruit is also efficacious.

May Fly, a family of insects resembling the dragon fly. The front wings are like those of a small dragon fly, but are exceedingly delicate. The hind wings are small or wanting. Both pairs are held straight up above the back when the insect alights. The abdomen terminates in two, sometimes three, thread-like appendages, longer than the entire body proper. The body is transparent. The adult female lays her eggs on the surface of the water, or wraps her wings about her and dives to the bottom and affixes them to stones. The young nymph is fitted both to crawl and to swim. It lives in the water on vegetation or insects from one to three years, according to the species, throwing off its skin perhaps a score of times. Some quiet afternoon in early summer it climbs out of the water, bursts its last nymph dress, and takes flight, a delicate winged insect. Then, strangely enough, it alights in a few minutes and sheds its first May fly skin from head, body, and wings, and takes its flight again. The fullgrown May fly has no mouth parts and takes no food. It lives but a day or a few hours, and has but one impulse, to lay its eggs and die. Sometimes at dusk of a quiet evening, May flies by the thousand may be seen dropping down to the surface of a lake to lay their eggs. All the while, a gulping noise and widening circles of ripples indicate that the fish are having the feast of a lifetime.

Mayo, the family name of America's most famous surgeons, William James Mayo, and Charles Horace Mayo, sons of William Worrall Mayo, all of Rochester, Minnesota. The father was born in England, but came to Minnesota in 1854, some years later settling in the little town of Rochester. Here the sons William J., born at Le Sueur, Minnesota, in 1861, and Charles H., born at Rochester in 1865, grew to manhood, receiving their education in the common schools and at Niles Academy, and clerking in drug stores, where they learned to put up their father's prescriptions. The elder obtained his medical education at the University of Michigan, receiving his degree in 1883. The younger graduated from the Chicago Medical College, now a part of Northwestern University, in 1888. In 1889, at the suggestion of Dr. W. W. Mayo, the Roman Catholic Sisters of St. Francis built St. Mary's Hospital at Rochester. With this hospital as headquarters the three surgeons have developed the greatest clinic in the world. Its importance may be estimated from the fact that so large a number of surgeons from all parts of the world visit it that a visiting surgeon's club is maintained, with a special building for their accommodation. A noted French savant says, "No surgeon in France has completed his education until he visits Rochester." The number of cures at this hospital in proportion to the number of operations performed exceeds that on record at any similar institution. During its first year of existence 300 patients were received. During 1909 the Mayos performed 7,717 operations, only ninety-two deaths occurring in the hospital. Of these operations, 1,325 were for appendicitis, and there were but four deaths out of this number. There is no known operation that the brothers have not performed, and some that were pre-

viously unknown they have undertaken with success. The hospital has been enlarged several times until it will accommodate about 300 patients, and no expense has been spared in its equipment. Other surgeons have been added to the staff, which now numbers about thirty men, each of whom has his specialty. Sometimes as many as two hundred patients consult them in one day. Each case is diagnosed with the utmost care, pathologists, electricians, chemists, bacteriologists, and laboratory experts being at hand to lend their aid in furnishing all possible details before the patient appears before one or the other of the two great surgeons whose duty consists in the final decision as to the necessary treatment and in the execution of that treatment. When the time comes for the operation there is no delay, nothing like experiment, the surgeon knows precisely what he is to do and does it, with a calmness, a poise, an assurance, and withal a rapidity that is a marvel to the observer. From twenty to fifty visiting surgeons are present daily, to watch and to listen, for the Mayos talk freely while operating, explaining every step.

As men, the Mayos are modest and retiring, hating publicity. It is said of them that their only ambition has been to do perfect work. Certain it is that their aim has been neither at wealth nor fame. They work for "the joy of the working," and for humanity. The penniless receive the same careful treatment that is accorded the rich.

In 1915 the brothers presented the University of Minnesota an endowment of $2,000,000 and their surgical laboratory.

Mayo, Henry Thomas (1856-), an American naval officer, was born at Burlington, Vermont, and was educated at the United States Naval Academy. After graduation in 1876 he served as a midshipman for two years; in 1878 he was raised to the rank of ensign. Thereafter his advancement was rapid, and in 1913 he was made rear admiral. Rear Admiral Mayo served on the original *Kearsarge,* and during the Spanish-American war he served on the *Bennington.* During 1905-07 he was Lighthouse Inspector for the twelfth district, and was secretary of the Lighthouse Board for the two following years. During 1911-13 he served as commandant of the Mare Island Navy Yard. In 1916 he was made admiral and was given command of the Atlantic fleet, serving in that capacity until the close of the World War, when his rank reverted to that of rear admiral.

Mayon, an active volcano and the highest peak on the island of Luzon, in the Philippine group; it is also sometimes called Albay, from the province of Albay, in which it is situated. The mountain rises sharply from the sea to a height of 7,920 feet. To passengers on incoming ships the cone is an interesting sight, whether seen in the day or at night. Only a white cloud of smoke is seen suspended over the crater during the day, but at night the cloud glows redly with the reflection of the fire below. The grass-carpeted sides of Mayon are extremely steep, and the ascent to the crater is difficult.

Mayon has erupted several times during the last hundred years, belching lava, ashes, cinders and glowing rocks. On one occasion, in 1814, a city at the foot of the volcano was destroyed, and more than 1,200 lives were lost. No serious eruption has occurred since 1897.

Mayor, the chief executive officer of an American, Canadian, English, Irish, French or English colonial city or town in which the commission form of government has not been adopted. The office has existed in the United States since the beginning of American colonial history, having been adopted from the English system of municipal government. In the beginning, the mayor of a city in America was appointed by the colonial governor, and was a member of the city council. But at a later time he was relieved of the duties of a councilman and was elected by the council, the practice of appointment being discontinued. A few cities, as Boston, always elected the mayor by popular vote instead of by vote of the council.

After the Revolutionary War the popular election took precedence of the council election, and the powers and duties of the mayor were greatly enlarged. His principal duty now is the enforcement of the city ordinances. A number of American cities have adopted the commission form of government, but in all the others a

mayor and a city council still prevail. The mayor usually has the judicial power of a justice of the peace, and issues as well as revokes licenses.

In England the mayor occupies a less important position than in the United States, although there too he presides over the aldermen and has judicial powers corresponding with those of a mayor in the States. There is usually considerable pomp connected with the English position, which often requires a socially prominent man, who can devote time to matters relating to the royalty, and also take an interest in welfare work. The chief executives of such towns as York, Dublin and London bear the title of Lord Mayor, and are entitled to a large allowance annually and the use of a mansion which goes with the title. The office is very much coveted for the prestige and prosperity it allows.

CANADA. In Canada the mayor has virtually the same duties as in the United States and Great Britain, where he also is known by the title of *warden,* or *reeve.* It is part of his duty to see that delinquent or otherwise unsatisfactory officials of the city receive dismissal or punishment or both.

The character of the mayor is reflected very markedly on the morale and policies of a city, and it is very important that upright, broad minded men be chosen for the office. Although politics must necessarily be considered, great care should be exercised by the voters of the city that inefficient men are not chosen for this most important office.

Mayweed, a composite plant, commonly known as dog's fennel and distinctive for its strong odor. Under the name of chamomile it is a medicinal plant of wide use. It is a native of Europe, but now a despised weed of the roadsides in the United States.

Mazarin, măz-a-reen′ or măz′a-rin, **Jules,** (1602-1661), a prime minister of France. He was the adherent and successor of the famous Richelieu. He was a native of Rome and was educated at a Jesuit college. He entered the pope's service. In 1624 he accompanied the papal legate to Paris and was hit upon by Richelieu as a person of talent and discretion to look after French affairs at Rome. In 1639 he openly entered the service of Richelieu. He was naturalized as a Frenchman, and in 1641 Richelieu secured him a cardinal's hat. At death Richelieu recommended Mazarin as the one person in France who had the knowledge and the talent to carry out the plans already under way. Mazarin found himself in difficulty. He took office in 1642. Louis XIII died the next year. Louis XIV was but five years old. The queen mother, Anne of Austria, hated him. He was a handsome, pleasing man. Like Crook-back Richard in Shakespeare's tragedy of *King Richard III,* he won Anne over, and is said to have married her in private. The nobility hated him and drove him twice from court; yet he regained the ascendency. His administration was marked by subtlety and intrigue. In foreign affairs, he gained the alliance of Cromwell, humiliated Spain, and acquired territory in Flanders and on the Rhine. He brought the Thirty Years' War to a close in 1648 by the treaty of Westphalia. At home he suppressed the uprising of the Fronde and withstood all efforts of the nobility to oust him from control. Under his administration taxation became more and more grinding. He managed, doubtless by corrupt means, to amass an immense fortune. Fearing discovery, he feigned generosity and offered the whole to the king, Louis XIV, but, as he had no doubt hoped, the sacrifice was declined. At his death his fortune was estimated at $40,000,000. He retired from office before Louis entered upon his great wars. He died at Vincennes and was succeeded by Colbert, a supporter of his policy as he had been a supporter of Richelieu. The famous Mazarin Library of Paris bears the cardinal's name. It contains, among other treasures, a copy of the first printed Bible. The popular estimate of Mazarin is summed up in the phrase relative to his succeeding Richelieu, "After the lion comes the fox." See RICHELIEU.

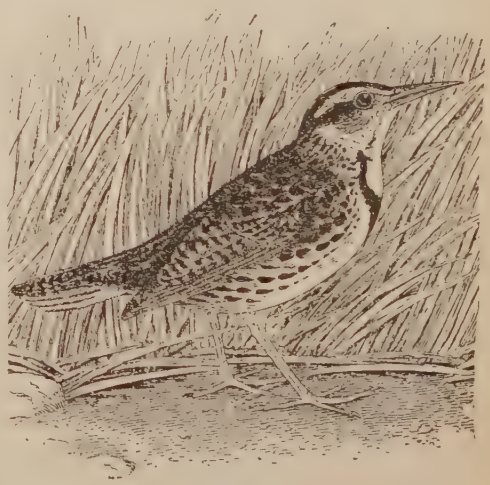
Maze. See LABYRINTH.

Mazeppa, Ivan (1644-1709), a Cossack chief. He was by birth a Pole. He belonged to a noble but poor family, and was brought up a page at the court of John Casimir, king of Poland. When a young

man he was detected in an intrigue with a Polish lady of high rank. Her husband by way of revenge bound Mazeppa to the back of a wild horse from the Ukraine. The horse was turned loose to gallop away to his native haunts. Mazeppa was released by some Cossack peasants. He remained among them and became a hetman or chief. He enjoyed the favor of Peter the Great, who made him prince of Ukraine. Desiring next to become independent, he conspired first with the king of Poland, then with Charles XII, the Madman of the North. On the downfall of the latter Mazeppa took poison. He is the hero of Byron's poem, *Mazeppa*.

Mazzini, mät-see'nee, **Giuseppe** (1805-1872), an Italian patriot. He was born at Genoa and died at Pisa. He was educated at the University of Genoa and entered upon the practice of law in his native city. He was an ardent republican, and desired to see the petty states into which Italy was cut up united in an Italian republic. He became a member of the secret society known as the Carbonari. In 1830 he was arrested by the monarchical government of Piedmont as a conspirator, but was released for want of proof. He then left Italy and resided in Marseilles, Paris, and London, keeping up a correspondence with the agitators in Italy. He founded a secret political society known as Young Italy. In 1848, the year of revolutions, he returned to Italy and established a short-lived republic in the city of Rome, then a papal state. In the following year he again went into exile. He was the terror of rulers. He organized insurrections in Mantua in 1852; Milan in 1853; and in Genoa in 1857. When unification came finally in the expansion of Victor Emmanuel's kingdom of Piedmont to include all Italy, Mazzini held back. He desired a republic. He even organized a republican insurrection at Palermo in 1870; but the government, remembering his earlier service for a united Italy, treated him leniently. His name is associated in history with that of Garibaldi. See ITALY; CAVOUR; EMMANUEL; GARIBALDI.

Meade, meed, **George Gordon** (1815-1872), an American soldier. He was born at Cadiz, Spain. He was educated at West Point. He served in the Seminole War in Florida and on Scott's staff in Mexico. He was an engineer of ability. He assisted in the location of the Alabama, Florida, and Georgia Railway, and took part in surveying the northern boundary of Maine. He was employed by the government in the construction of lighthouses and in a geodetic survey of the Great Lakes. He entered the Civil War with the rank of brigadier-general of volunteers and came out a major-general of the regular army in command of the Army of the Potomac. He took part in the peninsular campaign, and was in the battles of Manassas, South Mountain, Antietam, Fredericksburg, and Chancellorsville. He was in command at the memorable battle of Gettysburg. An equestrian statue of the able soldier has been erected on the battlefield. At the time of his death, which occurred in Philadelphia, he was in command of the department of the Atlantic.



Meadow lark.

Meadow Lark, a member of the oriole family. It is rather unfortunate that this fine bird should be called a lark, as it is much more nearly related to the bobolink and the blackbird. It is a dignified, well behaved, brown bird, with a fine yellow throat and breast marked with a black crescent. Its favorite perch is the top of a fence post. Neither timid nor familiar, it nests on the ground, generally overarching its home with grasses in the shelter

BATTLE OF GETTYSBURG
Charge of the Pennsylvania Volunteers
From the Painting by Paul Philliopoteaux

of a clod or tuft of some sort. Eggs, four to six, white, speckled with cinnamon. The meadow lark makes a harmless living on insects and seeds. Sportsmen are frequently deceived for an instant when their dogs, pointing for chickens and quail, flush a meadow lark. In flight it shows a white outer feather on each side of the tail. A western species, a trifle smaller than the preceding, breeds from the upper Mississippi Valley westward to British Columbia. It has a fine reputation as a songster.

Measles, mē'z'lz, a contagious disease characterized by mottled eruptions of the skin. It is thought to be a disease of considerable antiquity. Though with proper care it is not dangerous, it is very annoying. One who has had the disease is not likely to take it again. Medical science has not yet determined the specific cause, but it is thought to be due to a bacterium. In any case, the measles are communicated through the atmosphere by means of clothing, etc. From seven to fourteen days usually pass between the time of exposure and breaking out. Four thousand three hundred and two deaths from measles were reported from certain areas in the United States for the year 1907, a slight increase over the rate reported in the previous census. Singularly enough, the soldiers of the Confederate army were subject to an epidemic of the measles from which many died. See DISEASE.

Meat and Meat Packing. The term meat, while applicable to solid food of any kind, as when we speak of meat and drink, is generally applied to the flesh of warm-blooded animals ordinarily killed for food. Butcher-meat is the flesh of animals slaughtered by the butcher, or by meat packers, for food, such as that of oxen, sheep, pigs, etc., as distinguished from game or other animal or vegetable food. Red meat is meat which is usually served underdone, or preferred to be eaten rare, as beef, mutton, vension, canvasback, etc. Dark meat is that part of the flesh of some fowls or poultry which when cooked is not white or light, particularly the thighs and legs of turkeys. Light meat is the flesh of the breast and wings of various fowls which when cooked is of a whitish color. Fowls which have light meat are the varieties of the domestic hen, the turkey, various grouse, many partridges, as the bobwhite, etc. But the term meat, in a narrow sense, is confined to the flesh of mammals used for food, and thus distinguished from fowl or fish.

Meat obtained from the domestic animals, cattle, sheep, and pigs, consists of the muscular tissue, or lean, and the varying quantities of fat which are found in the different parts of the carcass between and within membranes and tendons. Lean meat also contains more or less fat, though it may be invisible. Most meat is eaten fresh, but great quantities are also salted, smoked, dried and canned. Meat packers usually deal in fresh meat as well as in meats prepared by various processes to be kept for future consumption. The meats commonly dealt in are the various cuts and grades of beef, mutton, lamb, veal and pork.

The methods of cutting up carcasses of meat animals, and the names of the various cuts, differ according to local preference. The cuts of beef, however, are quite generally known as follows: Neck, chuck, ribs, shouldered clod, fore shank, brisket, cross ribs, plate, navel, loin, flank, rump, round, second cut round and hind shank. The cuts of veal are: Neck, chuch, shoulder, fore shank, breast, ribs, loin, flank, leg and hind shank. The cuts of mutton or lamb are: Neck, chuck, shoulder, flank, loin or leg. The cuts of pork are: Head, shoulder, back, middle cut, belly, ham, ribs and loin.

Good meat should have little or no odor, should be of uniform color, neither abnormally pale nor inclined to purplish, and firm and elastic to the touch, without pitting or cracking on pressure. Its surface should be slightly moist, and it should become dry with keeping.

MEAT PACKING. The meat packing industry of the United States, centered in Chicago, is of immense proportions. The total number of animals slaughtered in wholesale slaughtering and meat packing establishments in 1919 was 73,256,127, an increase of 23 per cent in the five-year period from 1914. The cost of the animals slaughtered was $3,056,387,778. These figures do not include animals slaughtered

on farms and ranges, which in 1919 totaled 1,904,581 cattle; 434,608 sheep and lambs, goats and kids; and 16,800,608 hogs.

Over 160,000 wage-earners were employed in the meat packing industry in the United States in 1919, and the total value of the products was $4,246,291,000. In the state of Illinois alone there were 54,179 wage-earners employed, principally in the Union Stock Yards, Chicago, and their product was valued at more than $1,250,000,000. Kansas came next with nearly 18,000 employees and a product of $427,000,000, and Nebraska next with over 10,000 employees and $303,000,000 of product.

The domestic animals slaughtered in the United States in 1919 included 10,818,511 beeves, 4,395,675 calves, 44,520,726 hogs, 13,521,215 sheep and lambs, goats and kids. Practically every part of the carcass of these animals is now utilized by the packers for some purpose or other, and the great wastes of former days have been eliminated. Besides fresh meats, which are shipped all over the United States and in refrigerator ships to many foreign countries, the products of meat packers include pickled and other cured beef and pork, canned goods in immense quantities; sausage, both fresh and canned; meat puddings, scrapple, and head cheese; lard, also lard compounds and substitutes; oleo oil and other oils; tallow, oleo stock, grease, and soap stock; stearin (lard, oleo, and cottonseed oil); oleomargarine (125,000,000 lbs. in 1919); hoofs, horns, horn strips, etc.; fertilizers and fertilizer materials; glue, hides and pelts, to the value of nearly $250,000,000; cattle and hog hair, and a variety of other products too numerous to mention here.

The consumption per capita of dressed meat in the United States in 1921 was 144.8 lbs., or for each inhabitant 57.7 lbs. of beef, 8 lbs. of veal, 6.3 lbs. of mutton and lamb, and 72.8 lbs. of pork. Between 1900 and 1910 there was a decided reduction in the consumption of meat per capita, the figures falling from 179.3 lbs in 1900 to 146.2 lbs. in 1910, since which time the annual per-capita consumption has remained about the same

United States exports of beef, mutton, pork, and lard in 1920 were as follows: Fresh beef, 153,560,647 lbs.; fresh mutton, 3,958,131 lbs.; cured beef, 32,383,501 barrels; bacon, 803,666,917 lbs.; pickled pork, 41,643,119 lbs.; lard, 587,224,549 lbs. Except for lard, the export figures showed a decided falling off in 1921 and 1922, especially in the item of fresh beef, which was exported in immense quantities during the World War.

Mecca, a city of Arabia. It is the holy city of the Mohammedans. Their great prophet, Mohammed, was born here in 570. Mecca is situated in a blistering hot, sandy valley, about seventy miles from the Red Sea. The Kaaba, or Caaba, the most sacred shrine of the Islam religion, is here. It is a cube-shaped, flat-roofed building, in the center of an immense mosque. The mosque is a vast colonnaded square having nineteen entrances. The Kaaba contains a sacred black stone said to have been originally a ruby from heaven.

The city and the religious ceremonies are in charge of the direct descendants of Mohammed. They all wear a costume, noted chiefly for a green robe. They form a sort of aristocracy, and elect one of their number as sheriff of Mecca. The city is composed of flat-topped stone houses one to three stories in height. The streets are unpaved but are wide. The ordinary population of the city is about 60,000.

Mohammed enjoined upon his followers the religious duty of visiting Mecca at least once. Peasants hoard scanty earnings a lifetime that their eyes may behold "the mother of cities," that they may be present at the great annual festival, when one prayer counts for more than a thousand offered elsewhere. One stream of pilgrims comes by ship from Polynesia and Java, and from Farther India and Hindustan. Another stream of pilgrims comes from northern Africa, from Morocco, Algeria, Tunis, Egypt, and Turkey. They collect and set forth from Cairo. The caravans from Central Asia and Asia Minor increase in size as they come. It is estimated that not less than 100,000 pilgrims gather at the annual fair and fete. See CARAVAN; ARABIA; MOHAMMED; MEDINA.

Mechanics, a term popularly used as including the study of the general principles involved in the construction of machinery, or in structural work. Sometimes it is used as synonymous with dynamics which more properly deals with principles only. In this sense it has largely given way to the term dynamics. Applied mechanics is often employed for the more practical aspect of the subject. See DYNAMICS.

Mecklenburg, mek'len-boorg, Germany, a territory on the Baltic Sea, formerly a Saxon province divided into two grand-duchies, Mecklenburg-Schwerin and Mecklenburg-Strelitz. These provinces embrace an area of over 6,000 square miles and have a population of about 700,000. The capitals are Schwerin and Neu-Strelitz, respectively. Mecklenburg-Schwerin is watered by the Elbe and its tributaries. There are also many lakes and ponds. The country is generally flat with here and there low ranges of hills. The climate is mild and healthful. Dairying, stock-raising and agriculture are main industries, but there are also foundries, tanneries, papermills, sugar refineries, breweries, etc. Mecklenburg-Strelitz, is similar to the larger province in topography, industries and general characteristics, but the government is somewhat different. Part of the province, Ratzeburg, was governed directly by a Grand Duke. The district as a whole has one vote in the council of the empire. The predominating church in Mecklenburg is the Lutheran and the University of Rostock the most noted institution of learning. At Rostock is the seat of the supreme court, though each duchy has a separate system of lower courts.

Mecklenburg Declaration, a popular myth relating to Revolutionary times. On May 31, 1775, the farmers of Mecklenburg County, North Carolina, held a county meeting at which they adopted vigorous resolutions, declaring that a state of anarchy existed, and providing a provisional government during the continuance of the disorder. Like many similar resolutions by other counties and towns at about the same date, the resolutions open with a strong statement of allegiance and devotion to the British crown, and they contain no hint of independence.

But long after the Revolution all Mecklenburg records having been destroyed during the war, an old man's faulty memory distorted these resolutions into a "Declaration of Independence." He dated the meeting May 20, 1775, and wrote out, "according to the best of his recollection," a series of resolutions that, if genuine, would have anticipated the real declaration of Congress by thirteen months. In spite of conclusive arguments by Thomas Jefferson at the time, this spurious declaration passed into sober histories as an undoubted fact. The first serious shock to its acceptance came about the middle of the nineteenth century, when the historian Bancroft discovered in an old newspaper a copy of the undoubtedly genuine resolutions of May 31st. As he at once pointed out, these were absolutely inconsistent with any declaration of independence by the same people eleven days earlier. Since that time scholarly inquiry has completely demolished the story, though North Carolina prejudice and ignorant "patriotism" keep it still on the pages of many books. The whole incident is exceedingly instructive as showing how, even in recent times, a fanciful legend may steal the mantle of history.

Medea, me-dē'a. See JASON.

Medes, mēdz, an ancient people who occupied what is now northeastern Persia. They appear in history as the opponents of the Assyrians. They took Nineveh 606 B. C., but were themselves subjected by the Persians about 549 B. C. From that date the history of Media is bound up with that of Persia. The Medes appear to have been a warlike people. They worshiped the sun, the moon, Venus, fire, earth, winds, and water. See PERSIA.

Medford, Mass., a residential and industrial city, is situated on the Mystic River five miles northwest of Boston. While it is a residential suburb of Boston, it has also some important industrial interests and is of some historical interest. In the city are manufactured chemicals, dyes, cotton goods, bricks, machinery, and other articles. Medford is one of the oldest cities in the state.

Medford contains the library and museum of the Medford Historical Society, the Barnum Museum of Natural History, founded

by P. T. Barnum, and the Eaton Memorial Library. Here stands Craddock House, built in 1634, and said to be the oldest house in the United States retaining its original form. Craddock Bridge, built in 1638, is said to have been the first toll bridge in New England. Tufts College, founded in 1852, is also located here. The population was 39,038 in 1920.

Medici, mĕd'e-chē, a noted Italian family. The Medici family ruled Florence for generations. Popes Leo X and Clement VII were Medici. The fame of Florence as a center of art and literature was achieved under the patronage, chiefly, of the Medici. The most noted man of the family was probably Lorenzo, known as the Magnificent. The most noted woman was Catharine de Medici, known in history as the queen mother of France. The prevailing characteristics of the family appear to have been ability, artistic proclivities, and lack of conscience. The last of the family died in 1743. See FLORENCE; MACHIAVELLI; CATHERINE.

Medicine, (a) the healing art, or the art of preventing, curing, or alleviating diseases and remedying as far as possible the results of accidents and violence; (b) any substance used as a remedy for disease, or having a curative or remedial effect.

Practical medicine may be divided into three main branches, each of which is practised separately, although sometimes all are combined in a single practitioner; namely, medicine in the stricter sense of the treatment of disease, surgery and obstetrics. These are largely based on the sciences of anatomy and physiology, normal and pathological pharmacology, or knowledge of drugs and their action, and bacteriology. These sciences, having practical relations almost exclusively with medicine, are called the medical sciences and form distinct parts of that art.

Preventive medicine is that branch of medical science which has to do with the prevention of disease by means of personal and public hygiene. Psychological medicine is medical science in its relation to mental diseases. Rational medicine is the practice of the healing art based upon actual knowledge, and reasoning from the known to the unknown; hence opposed to empiricism, or an undue reliance upon individual experience. Suggestive medicine is the treatment of disease by mental suggestion or auto-suggestion, a method long practised by physicians in America and Europe, and popularized in the United States in 1922 by the visit of Coué, a French advocate of the power of auto-suggestion. See COUÉ.

The art of medicine was probably first cultivated in Egypt, the offices of priest and physician being combined in the same person. In the writings of Moses, there are several allusions to the practice of medicine among the Jews, especially with reference to the treatment of leprosy. The priests were the physicians, and their treatment mainly aimed at promoting cleanliness and preventing contagion. Medicine was no doubt practiced as an art among the ancient Greeks, and Aesculapius appears in the writings of Homer as an excellent physician, of human origin; in later legends he becomes the god of the healing art.

Hippocrates, the most celebrated physician of antiquity, is said to have been a descendant of Aesculapius, and was born about 460 B. C. The advance which he made in the practice of medicine was so great that no attempts were made for some centuries to improve upon his views and precepts. From his writings, it appears that he divided the causes of disease into two principal classes; the first consisting of the influence of seasons, climates, water, situation, etc., and the second of more personal causes, such as the food and exercise of the individual patient. His belief in the influence which different climates exert on the human constitution was strongly expressed. He ascribed to this influence both the conformation of the body and the disposition of the mind, and hence accounted for the differences between the hardy Greek and the Asiatic. His treatment of diseases was cautious, or what was later termed by physicians "expectant"; it consisted chiefly and often solely in attention to diet and regimen; and Hippocrates was often reproached with letting his patients die by doing nothing to keep them alive.

A famous medical school was established at Alexandria, by the gifts of the Ptolemies, about 300 B. C., and for some centuries after the practice of medicine was involved in a controversy between the Dogmatists, who followed the precepts of Hippocrates, and the sect or school of Empirics, founded by a professor at Alexandria. The dispute was academic rather than practical.

Medicine was introduced into Rome at a later period than the other arts and sciences. The first practitioner was banished because his treatment was so severe and unsuccessful; but a hundred years afterward another Roman physician gained a great reputation by going to the other extreme. He allowed his patients the liberal use of wine and of their favorite dishes, and in all other respects consulted their inclinations and flattered their prejudices. The first native Roman physician whose name has been tranmitted to us was Celsus, who wrote the history of medicine up to his time. Later came Andromachus, Pliny the naturalist, and others, down to Claudius Galenus, commonly called Galen, born in 130 A. D., who went to Rome in his 34th year and attained such a reputation that he was able to decline the post of physician to the emperor. The works of Galen on anatomy and physiology, on dietetics and hygiene, on pathology, diagnosis, pharmacy, and therapeutics, including surgery, were long regarded as the leading authorities in medicine. He was the first and greatest authority on the observation of the pulse in diagnosis and all subsequent writers adopted his system without alteration. His practice was based on two fundamental principles: (1) that disease is something contrary to nature; (2) that nature is to be preserved by that which has relation to nature.

Before Galen's time the medical profession was divided into several sects, who were always disputing with one another. After his time, all these sects seemed to have merged into his followers. In short, Galen reigned as supreme authority in medicine until the sixteenth century, when improvements in medical science consigned his writings to ultimate neglect, though his fame is imperishable.

Beginnings of Modern Medicine. The study of human anatomy may be said to have been first fairly established in the sixteenth century; chemistry was then separating itself from alchemy, and medicine advanced with the times, through the seventeenth and eighteenth centuries, until we reach the great and useful discoveries of the origin and treatment of diseases in the nineteenth century. These included the discovery by Jenner of vaccination as a means of preventing smallpox, the true and certain diagnosis between typhus and typhoid fever, and the discovery of Bright's disease of the kidneys, and the invention or practical application of many useful instruments, including the stethosocope, speculum, ophthalmoscope, and laryngoscope. The materia medica also received many important additions, among which may be noted quinine, morphia, strychnine, iodine and the iodides, the bromides, hydrocyanic acid, cod-liver oil, chloroform, and highly important anti-toxic serums, including that for diphtheria.

In the nineteenth century, also, Pasteur prepared the way for the germ theory of disease, and Lister introduced to surgery the antiseptic treatment of wounds. Koch in 1882 discovered the bacillus of tuberculosis. Sulphuric ether, chloroform, and cocaine were introduced for use as anaesthetics.

Preventive Medicine. The first quarter of the twentieth century has seen the development of organized preventive medicine. Hookworm, yellow fever, tropical dysentery, sleeping sickness, and other tropical diseases, formerly regarded as fatal, have been brought under control more or less successfully, largely by the efforts of American medical discoveries of value to humanity, especially in the diagnosis, test and remedy of venereal disease. Treatment of disease by the X-rays, or Roentgen rays, has been widely developed, while in surgery there have been many notable advances, some of which were due to the experience gained by army surgeons in the World War.

Medical Education. Medical education in the United States is carried on principally in connection with the state

and other universities, and in almost every state there is an examining board which holds periodic examinations which a physician must pass before he can be admitted to practice in the state. The first medical school in the United States was established in 1765 in connection with the College of Philadelphia, which later became the University of Pennsylvania. Two years later the medical department of King's College, New York, was founded, this college being now Columbia University, which had in 1922 the largest enrollment of students in the United States. Harvard medical department was established in 1782. In recent years there has been a gradual elevation of the standards of medical education, and the tendency has been for independent medical schools to affiliate with universities and for all medical schools to establish closer relations with hospitals. While less than fifty years ago there were no medical schools in the United States which required even a three years' course for graduates as doctors of medicine, a four years' course is now the standard requirement before a school is admitted to membership in the Association of American Medical Colleges, and the American Medical Association also carefully guards the portals of entry to the medical profession.

Students of both sexes are now accepted by most medical colleges, and many women practice medicine successfully in all civilized countries. The United States army and navy maintain medical schools at Washington, D. C., in control of the medical department of each service, with military and naval hospitals in various cities.

Medicine Hat, Alberta, an important industrial city, is 180 miles east of Calgary and 600 miles west of Winnipeg, a divisional point on the Canadian Pacific Railway and situated on the banks of the South Saskatchewan River. Medicine Hat is located in the midst of an extensive natural gas field, with twenty-two wells inside the city limits, the total consumption from which was 1,167,000,000 cubic feet in 1921; fourteen of these gas wells are owned by the city. The public utilities consisting of natural gas, water, light and electric power systems are all municipally owned. The city contains a 500,000 bushel elevator, besides smaller ones, all told totaling 850,000 bushels capacity; three flour mills, with an annual run of 4,500,000 bushels of wheat alone; and manufactories of brick, brass and galvanized ware, candy, pumps, linseed oil, meal and cake, clay products, including sewer pipe, tile, building materials, stoneware and crockery, farm machinery, foundry and machine shop products, farm tractors, lumber and other articles.

Medicine Hat streets and buildings are lighted with natural gas, the latter being also electrically lighted, and in other ways is modern. There are four spacious parks, good hotels, an armoury, a general hospital and a Roman Catholic academy. The educational system is adequate, comprising nine public schools, and one separate (R. C.) school and a high school.

Given sufficient moisture the land surrounding the city is abundantly productive of cereal crops. In 1901 Medicine Hat had a population of only 1,570; in 1922 the inhabitants numbered 9,575.

Medicine Man, a distinguished representative of the American Indian, South Sea Islands, and other savage tribes. He is healer, priest, and physician to his tribe. Among the aborigines he was nothing more than a magician and laid no claim to medical knowledge. His chief credentials were a lot of death charms and talismans which he carried about in a bag. He is treated with greatest respect.

Medina, a city of Arabia. It is situated about 250 miles northwest of Mecca, about 105 miles in a direct line from the Red Sea. In 622 the flight of Mohammed from Mecca to Medina, known as the Hegira, took place. He died and was buried here. His remains rest in a tomb contained within the Great Mosque. The interior of this edifice measures about 390 by 500 feet. It is surrouned by galleries. Medina was the capital of Islam until 658 A. D. Being the burial place of the great prophet, it is one of the holy cities of the Mohammedans, second only to Mecca as a place of pilgrimage. The ordinary population is about 16,000. In 1908 a railway was completed from Damascus to Medina, a dis-

tance of 820 miles. See MECCA; MOHAMMED.

Mediterranean Sea, the great inland sea of the Old World. The name signifies *between worlds.* It lies between Europe, Africa, and Asia. The Mediterranean lies in a hot, dry climate. The waters are intensely blue and very salt. Three times as much water is evaporated from its surface as is received from the Nile, Hellespont, Po, and other rivers. A western current sets in through the Strait of Gibraltar to make up the deficiency. The sea was at one time a much larger body of water extending eastward into Central Asia beyond the Caspian and the Aral. The present length from the Strait of Gibraltar to Syria is 2,200 miles; its greatest width is 500 miles; the greatest depth, 13,000 feet. The area is about 900,000 square miles.

Owing to the narrowness of the Strait of Gibraltar, the tides are those of a lake rather than those of an ocean. The tides vary from a few inches to six feet. Shallows, reaching from Italy by way of Sicily to the coast of Tunis, divide the Mediterranean into two basins, an eastern and a western. The western basin is comparatively regular in outline, the deepest gulfs being those of Lyons and Genoa. Sardinia, Corsica, and the Balearic Isles are situated in this basin. The eastern basin is very irregular. Two arms are known as the Adriatic and the Aegean. The principal islands are Cyprus, Rhodes, Crete, and Malta. The waters of the Mediterranean are noted for fisheries, including sardines, sponges, and corals. The Mediterranean is the most noted body of water in history. Its shores were in all probability the seat of the earliest civilization.

Medulla Oblongata. See BRAIN.

Medusa, in Greek mythology, one of the Gorgons. According to Hesiod there were three of these monsters. Medusa alone was subject to death, the others being immortal. The legend runs that Medusa was a beautiful maiden whose glorious hair was praised until she grew vain, and at last dared to compare her beauty with that of Minerva. The jealous goddess punished her by changing her lovely curls into hissing serpents. Her disposition changed also and she became cruel. All who looked at her terrible face surrounded by the writhing snakes were immediately turned into stone. About the cavern where she lived were many figures of men and animals who had been petrified by looking in her face. At last the hero Perseus slew Medusa. He was careful not to look at her directly, but, watching her reflection in his bright shield, cut off her head, which he carried to Minerva. Minerva placed the head in the middle of her aegis. Medusa has been represented frequently in art. The most famous painting of her is by Leonardo da Vinci.

Meehan, mē'an, **Thomas** (1826-1901), a celebrated American gardener. He was born near London, the son of an English gardener. He was employed in the Kew Gardens for two years. In 1848 he came to Philadelphia to take charge of Bartram's Gardens, now a part of the public park system of that city. Six years later he established the celebrated Germantown nurseries. He was for thirty years the editor of the *Gardener's Monthly.* In 1878 he began to publish *The Native Flowers and Ferns of the United States.* He founded *Meehan's Monthly* in 1891. He was a member of various learned societies, and held the office of state botanist of Pennsylvania. He was a strong believer in the theory of evolution as applied to plants, and was a remarkably successful breeder of new varieties. See BURBANK.

Meerschaum, a creamy colored mineral much used in the manufacture of tobacco pipes. It is composed of silica, magnesia, and water. When fresh meerschaum is rubbed with water it forms a foamy lather like soap. The name has reference to this peculiarity. It is a German word signifying sea foam. The chief meerschaum deposits are found in Asia Minor and in the island of Euboea. There are supplies in Spain, Moravia, and the Crimea, but at present practically the sole commercial supply is derived from some 1,270 pits in the vicinity of a city in Asia Minor. The industry is about 2,000 years old.

About 5,000 miners are engaged in the pits. The meerschaum occurs in the form of nuggets or nodules scattered throughout a layer of red earth. The miners work

in groups of two to five, under the direction of a foreman. A well or pit is dug in the most primitive manner with shovels and picks. The layer of red earth may be found at a depth of a few yards, but ordinarily it is from sixty to 180 feet beneath the surface. The earth is dug out with picks. Natural columns of earth are left to support the overlying dirt. The nuggets are brought to the surface and scraped clean. Most of the nodules are of the size of a walnut. They are sorted in four principal sizes. There are thirteen commercial qualities. Formerly Vienna purchased almost the entire output, and sold to German pipe-makers; but now shipments are made to Constantinople, Paris, London, Hamburg, New York, and other pipe-making centers. There the cubes are variously carved into pipe bowls. When fitted with amber mouthpieces, they are considered the most stylish pipe made. Meerschaum hardens with exposure to air, a process which is hastened by the maker who bakes his pipes, boils them in milk, polishes them, and boils them again in oil. When in use the moisture and heat of burning tobacco turn the white meerschaum to a rich brown color. Imitation meerschaum is made of plaster of Paris, hardened with paraffin and colored in various ways. The fragments which fall in the carving of pipes are ground, mixed into a paste, and pressed into cheap meerschaums. A variety of meerschaum clay is found in South Carolina. The annual value of the crude meerschaum is about $260,000.

Megaliths, a term applied to stones of great size, either when found singly, as in the "megalithic monuments" of antiquity, or used in construction, as in the pyramids of Egypt. Megalithic architecture refers particularly to buildings composed of massive stones, but the term is now used almost exclusively of ancient structures.

The megaliths best known are a peculiar class of monuments or remains of which the most essential feature is that the stones used in their construction in most cases have nearly if not quite their natural form. Hence these remains, in so far as they consist of stone, are usually classed by writers as antiquarians as "rude stone monuments." The stones used in them are usually, though not always, of very large size. The earliest of these monuments belong to a primitive period of rude, savage life, and their massiveness often seems to symbolize barbarian power; but there are frequent traces in history, alike throughout the earliest seats of the oldest civilization and in the earliest written records, including the historical books of the Old Testament, of the erection of the simple monolith, or unhewn pillar of stone, as a record of interesting events, a monumental memorial, or a landmark.

Megalithic structures include menhirs, cromlechs, dolmens, and the like, and all these forms have been found in India, having a recognized purpose among the ruder indigenous tribes. But the region especially notable for the number and variety of its megalithic remains extends from northern Africa, through France and Great Britain to Scandinavia. The most remarkable display of the various forms is in Algiers, in Brittany, in Cornwall and various districts of southwestern England and Wales, as well as in parts of Ireland and Scotland; also in northern Germany, Denmark and southern Scandinavia. There are also great numbers of dolmens and tumuli in India, especially in the hills of Khassia, where such monuments are still erected by the natives.

Menhirs are monumental stones, usually tall and massive, either entirely rough or partly cut, and are set upright in or on the ground, either singly or in groups, alinements, circles, or other combinations. Their history can be traced back to the times when these rude stone pillars, with or without still ruder inscriptions, were gradually superseding the earthen tumuli, or mounds, as a record of the dead. They are very abundant in Brittany, France.

A cromlech is a megalithic monument consisting of a large flat unhewn stone resting horizontally upon three or more upright stones. Such monuments are of common occurrence in parts of Great Britain, as in Wales, Devonshire, and Cornwall; also in Ireland, Brittany, and other parts of Europe. Cromlechs having been found in

the heart of burial-mounds, or "barrows," with their rude chambers abounding with sepulchral remains, including skeletons and urns, they are supposed to have been monuments of the dead.

A dolmen is a monumental structure similar to a cromlech, but the name is also sometimes given to structures where several large blocks of unhewn stone are raised upon pillars to form a sort of gallery. One of these, near Saumur, France, is 64 ft. long, 14 ft. wide, and about 6 ft. high, and consists of four upright stones on each side, one at each end, and four on the top. Another noted dolmen consists of a great stone 33 ft. long, 14½ ft. deep, and 18½ on the points of two natural rocks. Dolmens are supposed to have been sepulchers, afterward perhaps used as altars. They are found in India, Circassia, Algeria, and various parts of Europe.

The menhir and dolmen are most characteristic of the various forms of megalithic construction, but circles and avenues or lines of standing stones, as well as tumuli or barrows of earth, either covering or inclosing dolmens and frequently surrounded by one or more rows or circles of upright stones, are almost equally common and characteristic.

One of the most important of the megalithic monuments of the world is that of Stonehenge, on Salisbury Plain, Wiltshire, England. It is not only composed of large stones, but combines a number of types of ancient monumental construction. The original plan seems to have included two concentric circles of upright stones inclosing two ellipses. In the middle there is a great slab, 15 ft. in length, called the altar. Seventeen stones of the outer circle, 16 to 18 ft. high, are standing, connected in part by lintel slabs resting on their tops. The outer circle of stones is about 300 ft. in circumference. The origin of these remains is shrouded in mystery. By some antiquarians the structure is supposed to have been a temple to the Celtic god Zeus, the god of light, while others attribute it to the ancient Druids.

Megaphone, a conical form of speaking-trumpet, used for the purpose of magnifying the volume of the human voice and carrying it to a distance. It usually consists of a large funnel of tin, papier-maché, or other material, with a mouthpiece, into which the words intended for transmission are spoken or sung. The size and shape of the megaphone are so regulated as to strengthen the usual tones of the voice to the maximum degree. The conical or funnel shape of the device collects and reflects the sound waves of the voice so that they issue from its mouth in directions that are approximately parallel, instead of spreading from the mouth of the speaker or singer at a wide angle, with weakening effect upon the tones. The megaphone has superseded the old form of speaking trumpet for use on board ship, in giving orders, communicating with a passing vessel, or one lying nearby, or in hailing the shore. It is also utilized in addressing large crowds, leading cheers at college games, coaching boat crews, and for many other similar purposes.

The name megaphone was also given to an instrument invented by Thomas A. Edison for assisting hearing, adapted for use by deaf persons or for the perception of ordinary sounds at great distances. It consisted essentially of two large funnel-shaped receivers for collecting the sound waves, which were conducted to the ear by flexible tubes.

Meg Merrilies, mĕr'ĭ-lēs, in Scott's *Guy Mannering,* a half insane gypsy who plays a most picturesque and effective part in the romance. She is devoted to the Bertrams, and is wounded fatally while trying to restore Henry Bertram to his rights as heir of Godfrey Bertram, Laird of Ellagowan. In the dramatization of the novel, Charlotte Cushman became famous in the rôle of Meg Merrilies.

Meissonier, mā-so-ne-ā' **Jean** (1815-1891), a celebrated French painter. He was born at Lyons and died at Paris. His specialty was historical paintings. His favorite subjects were military pictures, representing guards, soldiers playing cards or drinking, and the like. Some of his paintings hang in the Louvre. The most celebrated of all his pictures are a set of four, known as the *Napoleon Cycle.* One of

them, called 1807, is owned by the Metropolitan Museum of Art, New York. It was purchased in 1887 at a cost of $66,000.

Meistersingers, mīs'tĕr-sĭng-ĕrs, a name adopted by certain associations of German singers who flourished chiefly in the fourteenth and fifteenth centuries. These associations may be described as musical guilds formed on the pattern of craft guilds. They were formed by music-loving citizens of the Free Cities. Guilds of this sort arose in Strasburg, Augsburg, Mainz, Nuremberg, and other German cities. They appear to have been societies of would-be poets. They met originally, it may be, to listen to the songs of the minnesingers. They were people of poetical inclinations and were ambitious to compose poetry. The composition of a song, original in its make-up, if not in matter, was made a requisite for admission. Poets' clubs, literary clubs, these guilds may be called. The great mass of poetry produced was rude and of little value. The songs were lyrical and were sung to music. A code of thirty-two rules governing their composition has been preserved. The meistersingers were rather a convivial lot, given to freedom of discussion. They were not encouraged by the church. A guild existed at Ulm until 1839. The most celebrated meistersinger is Hans Sachs, a peasant shoemaker of Nuremberg. It was his pride that he had composed 4,275 meister songs. See SACHS.

Melanchthon, me-lănk'thon, **Philip** (1497-1560), a German reformer. His original name was Schwarzerde, meaning black earth, which, by translation into Greek, becomes Melanchthon. He was educated at the University of Tübingen. He became professor of Greek at Wittenberg in 1518, and was a co-laborer of Luther. He had a prominent hand in drawing up the Augsburg Confession, the creed of the Lutheran churches. He took part in numerous conferences between the Catholics and the Lutherans. He was a man of scholarship and peace, ever reluctant to adopt extreme measures. As illustrative of the different temperaments of the two men, Luther and Melanchthon are said to have expounded the words, "He descended into Hell," quite differently. Melanchthon suggested that is was "to talk with Plato, Socrates, and the other wise ancients"; Luther boldly asserted that it was "to grapple in a hand-to-hand conflict with Satan himself."

Melba, Nellie (1866-), an Australian operatic soprano, one of the most prominent of living opera stars. She was born at Melbourne, Australia, whence she derived her stage name, Melba. Her family name was Mitchell. At the age of three she began the study of the piano under her mother, and she appeared as a concert singer at six. Madame Melba made her professional debut in Brussels, after a period of study under Madame Marchesi in Paris. Her first role was Gilda in *Rigoletto.* Success was immediate. Madame Melba made her first American appearance at the Metropolitan Opera House in 1893 as Lucia in *Lucia de Lammermoor.* She has since successfully toured the United States and the leading European countries, with particular success in *Hamlet, La Traviata* and *Romeo and Juliet.* Upon her return to Australia in 1903 she was publicly received by the heads of the colonial governments and sang to immense audiences. She has limited dramatic ability, but her voice is of a wonderful purity and power.

Melbourne, Australia, a port of entry and the capital of the state of Victoria, is situated on the Yarra River a few miles from its mouth in Hobson's Bay, and 500 miles southwest of Sydney. Hobson's Bay is the northern extremity of Port Phillip, a commodious inlet whose entrance is 40 miles south of Melbourne. The largest vessels come within 2½ miles of Melbourne's business center, but light craft ascend the river to the heart of the city. Having these good facilities, Melbourne is one of the principal British colonial ports, and in Australia ranks next to Sydney, or second. The city is the center of the Australian state railroad system.

Melbourne is a well planned, modern city. The streets, laid out straight and wide, are paved with wood blocks or macadam, are pleasantly shaded and electrically lighted. There is a good street rail-

way system. The width of the most important streets is ninety-nine feet.

This Australian trade and industrial center is new, and has, therefore, taken advantage of all the latest developments in building construction. As a result, its public, and many of its private buildings are as fine as those of any city in the world of like size. The most noteworthy are the Houses of Parliament, the mint, treasury, custom office, postoffice, the law courts, public library, Technological Museum, National Gallery, town hall and the university. Others are the offices of the Equitable Life Assurance Society (United States), St. Patrick's Catholic Cathedral, St. Paul's Anglican Cathedral, Wesley, Baptist and Independent churches, City Baths, Produce, Eastern, Western, Fish, Hay and Cattle markets, banks and theaters. Melbourne has botanical and zoological gardens and numerous other beautiful recreation spots.

The industrial life of Melbourne is represented by factories producing, in a long list of commodities, jewelry, furniture, clothing, leather, boots and shoes, caskets, chemicals, flour and grist, bricks, machine shop and foundry products, fresh dressed and smoked meats, brewery products, hardware, paints and lumber.

Melbourne was founded in 1835 under the name of Dootigala; the name was changed in 1837. The settlement grew rapidly after the Victorian gold discovery of 1851; in that year the town was chosen as the capital of the province of Victoria. The first Australian Commonwealth Parliament met here in 1901. In 1921 the population was 784,000.

Meleager, mel-e-ā′jér, in Greek legend, the son of Oeneus, king of Calydon, and Althea, his wife. When her child was born the three Fates appeared to Althea and foretold that his life should last no longer than the brand then burning on the hearth. Althea seized the brand, quenched the flame, and concealed the half consumed wood that she might thus preserve the life of her son. Meleager grew to be a brave and handsome youth. His father Oeneus offended Diana by omitting to pay her honor when he sacrificed to the gods. As a punishment, Diana sent an enormous wild boar to devastate the fields of Calydon. The crops were laid waste, the flocks and herds thrown into confusion, and many animals slain. The boar could not be routed by any ordinary means. At last Meleager called together the heroes of Greece determined to hunt the boar to the death. Theseus, Pirithous, Jason, Peleus, Nestor, and many others joined the hunt. Among them came Atalanta, the beautiful maiden devoted to Diana and the chase. The hunters pursued the boar to a marsh where he turned and attacked them. Several were slain. Jason touched the beast with his spear but failed to wound him. Nestor had to climb a tree to escape death. At last one of Atalanta's arrows inflicted a wound that drew blood, and Meleager, aroused to the highest pitch of daring, rushed forward and thrust his spear into the monster's side. Meleager was praised and honored by his comrades, but when he bestowed the head and hide of the boar upon Atalanta envy was excited. Meleager's uncles, Plexippus and Toxeus, snatched the trophy from the maiden's hands. Meleager, angered by this insult, slew his uncles.

When Althea learned that her son had slain her brothers she was overcome with grief and horror. She ordered a fire to be prepared and, bringing forth the fatal brand she had so carefully hidden, she cast it upon the flames. Then, overcome by what she had done, she took her own life. Meleager, as the fire burned, felt its consuming force in his own body and breathed his last as the brand sank into ashes. His sisters mourned for him so inconsolably that Diana in pity changed them into birds.

Melodrama, properly, a form of drama in which speech and song, or instrumental music, alternate. As commonly used, a melodrama is a sensational play full of unnatural situations and exaggerated sentiment. The music is of minor importance, often accompanying only the more pathetic passages. In opera, the term melodrama is sometimes used to designate such parts as are spoken instead of sung by the actors, but to a musical accompaniment. S. DRAMA; COMEDY; TRAGEDY.

Melpomene, mĕl-pŏm′ĕ-nē, in Greek

mythology, one of the nine muses. Tragedy was her special province. She was represented in art with a mask in her hand. An antique statue of Melpomene is in the Louvre at Paris. Though it is thirteen feet high it is carved from a single block of marble. The figure is fully draped, and the left hand holds a bearded, open-mouthed mask. See MUSES.

Melrose, a village in Scotland situated on the Tweed, twenty-nine miles southeast of Edinburgh. Abbotsford, the home of Sir Walter Scott, lies three miles to the northward. The village is celebrated for the ruins of Melrose Abbey. They are considered the finest in Scotland. For a brief but telling description, the reader is referred to Scott's famous lines in *The Lay of the Last Minstrel,* beginning,

> If thou would'st view fair Melrose aright,
> Go visit it by the pale moonlight.

The Abbey was founded by King David I, 1136. The body of the church was 258 feet long and 137 feet wide. The general style is ornate Gothic. It is built of sandstone. See ABBOTSFORD.

Melting, or Fusion, passing from a solid to a liquid state. In theory, any solid may be turned into a liquid if heated sufficiently. Some solids, as ice, pass into a liquid abruptly; others, like iron, soften and yield before melting. Most substances increase slightly in volume as they melt, as may be noted by the fact that the unmelted portion lies at the bottom of the crucible. Cast iron, ice, and bismuth are exceptions. They float, showing that they shrink as they melt. As is well known, ice is lighter than water. Most metals melt at a higher temperature if subjected to increased pressure, but pressure assists the melting of ice and cast iron. Under ordinary or the same conditions of pressure, a substance always melts at the same temperature, and remains at that temperature during the process of melting. Ice, for instance, never fails to melt at 0° C. or 32° F., and, though thrown into boiling hot water, its temperature remains at 0° C. or 32° F. until it is entirely melted.

TABLE OF MELTING POINTS—CENTIGRADE SCALE.

Ice	0°
Butter and lard	33°
Mercury	39°
Phosphorus	44°
Potassium	63°
Wax	65°
Sodium	95°
Sulphur	110°
Tin	230°
Bismuth	262°
Lead	326°
Zinc	412°
Antimony	432°
Aluminum	600°
Bronze	900°
Silver	954°
Gold	1045°
Copper	1054°
Cast Iron	1150°
Steel	1350°
Wrought Iron	1550°
Platinum	1775°

Melton. See KERSEY.

Melville, Saskatchewan, a division point on the main line of the Canadian National Railways, is ninety-eight miles north of Regina and 279 miles west of Winnipeg. It is in the heart of a rich agricultural region and has a large trade in grain and produce. Melville contains extensive railroad shops, a flour mill, grain elevators, petroleum refineries and other industrial establishments. The municipality owns and operates the water works and electric light plant.

The schools are modern, and include the Lutheran College. The Qu 'Appelle Valley, not far from Melville, offers good hunting and fishing and is a favorite ground for sportsmen. Melville has a large general hospital; and there are two public parks, skating and curling rinks, and other places of amusement. In 1921 the population was 2,808.

Memnon, in Greek legend, an Ethiopian hero of the Trojan War. He is mentioned in the Homeric poems, and is thought by certain critics to typify "the eastern sun summoned to oppose the enemies of darkness from the west." Memnon, according to fable, was the son of Tithonus, and Eos, or Aurora, the Dawn. After the death of Hector, he led a host of Ethiopians to the aid of Troy. He wore bright armor made by Hephaestus, and performed prodigies of valor. He was slain at last by Achilles. Several stories are told of the disposition of his body, the most popular being that Aurora bore it through the air to Susa, where it was buried in the Acropolis. The scene of Aurora's journey with the body of her son is depicted on certain early Greek

vases, and is supposed to typify the journey of the sun, offspring of the dawn, through the heavens to its resting place in the west. Memnonia, temples in honor of Memnon, were erected, one at Susa in Persia, the other at Thebes in Egypt. Two colossal statues of Amenhotep III at Thebes during the first century A. D. became connected with the myth of Memnon. One of these statues is called "the vocal Memnon." It had the peculiar property of giving out a musical note when the sun's rays first struck it in the morning. The phenomenon, if true, is thought to have been due to the expanding effect of heat upon a cold, damp stone. The low, humming sound was popularly supposed to be the greeting of Memnon to his mother, the Dawn.

Memorial Day. See DECORATION DAY.

Memory, a name applied to a very complex group of changes in consciousness. It is more accurate to say memories than memory, for investigation can reveal no such thing as a general faculty of memory. A mind may have very good memories in some phases of its experience and very poor in others. A scientist may remember innumerable facts within his field of investigation and at the same time fail to remember recent political changes. A high school boy often has remarkable memories of sporting events and almost no memories of history and algebra.

Memories vary greatly according to types of mental imagery. Many minds remember mostly in terms of visual imagery. These are the "eye-minded." They learn quickly anything they can see, but recall oral direction very imperfectly. Others remember best the things they hear. These have the auditory or "ear-minded" type of memories. Anyone who hopes to gain eminence in music should have strong tendency to remember in terms of auditory imagery. Great variations exist in the vividness of touch, taste, and smell imagery. Lower animals indicate that smell images play a very important part in their remembering. Dogs are guided more by smell than by sight.

Four factors are involved in conscious remembering. The *living brain cortex* must receive and retain the impression; *experience* of some kind is a factor in making an impression upon the brain; an appropriate *suggestion* is necessary to call up the past experience, and the fourth factor is *recognition.* The mind must recognize the reproduced experience as something which has been in consciousness before.

Brains differ greatly in receptiveness. The older they grow, the less receptive they seem to be. New experiences make little impression upon very old people. Receptivity varies also with health. A man who is ill or starving for food cannot receive impressions in such a way as to retain them. Long hours in bad air often lowers the receptivity of school children.

Individuals differ greatly in the retentiveness of their brains. Retentiveness is thought to be a fixed characteristic. Committing to memory does not change retentiveness any more than looking at blue changes the color of the eyes. Improvement from memorizing may come, however, from the better habits of study which it may help to fix and the greater number of associations and correlations a great deal of memorizing necessarily involves.

The experience which makes the impression may be object or process, sensation or thought. The mind tends to remember all of its experiences. It is thought that records of all experiences are made in the brain. But very many experiences are never recalled because the appropriate suggestion does not recur.

Appropriate suggestion is some experience so associated with another that the first tends to bring the second into the focus of consciousness. Some experiences are associated and therefore tend to suggest each other because they occurred together in time and space. This is often called association by contiguity; the experiences touch each other. But associations due to logical relations are better. All teaching should attempt to establish reasonable associations. The succession of presidents may be learned by dint of repetition or help of a rhyme, but it is far better for the student to become conscious of casual relations. All correlation in studies should be on the basis of logical relationship. It is reasonable and educative to correlate

history and geography. An attempt to correlate history and mathematics is likely to become absurd.

The brain may tend to record all experience, but many experiences are not remembered because the appropriate suggestion does not recur, and many experiences which are reproduced are not recognized as having been in consciousness before. Reproduction of mental experiences without recognition is not remembering; it is reproductive imagining. (See IMAGINATION.) Helen Kellar reproduced a story which had been told to her years before. She did not recognize it as a former experience. The story was published as her own invention. Others recognized it, and Miss Kellar was charged with plagiarism, though she was entirely innocent. Probably many people are crediting themselves with originality when their ideas are really but reproductions of former experiences which they do not recognize.

In addition to recognition, the most perfect act of remembering involves localization. This means that the experience recalled is placed in time or space, or perhaps in both. Localization is not so essential as recognition, yet it is of great biological value. The memories of lower animals show a strong tendency to localize in space. This is probably related to the fact that their associations are not based so much upon reasonable relationship as upon mere continguity. The carpenter who has placed a tool somewhere and cannot remember the place may well wish that he could localize as do the lower animals.

When memories are lost or changed as often occurs in disease or accident, the personality is decidedly altered. Perhaps complete destruction of memory means loss of personality. Destruction of certain parts of the brain is known to destroy certain memories. When the brain is entirely destroyed that may be the end of personal existence. No one knows. If memories are carried beyond the destruction of the body, it were well to have something worth remembering.

Memphis, an ancient city of Egypt. It was near the apex of the Nile delta, two miles south of Cairo. It rivaled Thebes in wealth and magnificence. After the fall of that city it became the capital of Egypt. It had a position of commanding commercial importance, being readily accessible from both the Mediterranean and the upper Nile. Extensive canals added to its commercial facilities. At present the site is occupied by squalid villages or strewn with blocks of granite half buried in sand. The remains are sufficient to show, however, quite independent of the accounts of the ancient geographers, that Memphis was a city of magnificent palaces and temples. There are colossal statues, variously described as from forty-five to seventy-five feet in height. One of the most striking features of the ancient city must have been an immense cemetery, known as the necropolis. In the center of the cemetery rose the pyramids of Memphis, in which the remains of kings were buried. The official nilometer of the ancients, a pillar on which the rising and falling waters of the Nile were recorded, stood in the river here. See PYRAMIDS; NILE; CAIRO.

Memphis, Tenn., the commercial capital and largest city of the state, is situated at the head of deep water navigation on the Mississippi River, 454 miles below St. Louis and 739 above New Orleans. Memphis is the county seat of Shelby County and is the largest river city between the two cities named above. The city is built on a plateau that is 32 feet above flood water mark at the river front, and rises to as high as 80 feet farther back from the river. It is served by numerous lines of steamers (Memphis being the home port of a number of them) and by the Saint Louis, Iron Mountain & Southern, Yazoo & Mississippi, Southern, Saint Louis, Chicago, Rock Island & Pacific, Louisville & Nashville, Illinois Central, Saint Louis Southwestern and Chicago, Saint Louis & San Francisco railroads. Along the river at this point is a wide levee and the city streets are wide, shaded and paved.

PARKS, BUILDINGS AND INSTITUTIONS. In the matter of beautiful public parks and places of amusement Memphis is far ahead of many other American cities. The park system embraces about 1,150 acres of natural woodland, the largest park having an area of about 430 acres. The Zoological Gardens, the Brooks Memorial

Art Gallery and the Cossitt and other public libraries are places of interest.

Memphis has two large Union stations, a Cotton Exchange and a Merchants Exchange, a custom house, large court house, post office, many fine hotels and a number of imposing churches. Some of the office buildings are in the skyscraper class and are modern in every appointment.

The medical department of the University of Tennessee is located at Memphis, as well as the Goodwyn Institute, many private and vocational schools, good high schools, Hannibal Medical College, a state normal school, Le Moyne Normal Institute and several schools for negroes. St. Joseph's Baptist Memorial, United States Marine, Tuberculosis and Municipal hospitals are all modern and complete in their equipment.

Commerce And Industry. The railroads, which cross the river here on two long steel bridges, and the river steamers, carry to and from Memphis an immense annual volume of merchandise. It is one of the largest inland cotton markets in the world, and ranks high as a market for cotton-seed oil, hardwood lumber, grain, foodstuffs and clothing.

The industrial plants of Memphis are too numerous for enumeration, and only a partial list of the articles that issue from them includes cotton-seed oil and cake, rice, paper, lumber, sashe, doors and woodenware, wood fiber and wood pulp, foundry and machine shop products, stoves and ranges, bricks, tile and pottery, engines, harness, cotton gins and boilers. The industrial growth of this city has been steady and there is nothing to indicate that it will not continue so.

History. The site of Memphis was important to the Indians as a ford and as a meeting place long before the whites came to America. De Soto crossed the river here in 1541 and the site was later visited by Marquette, Joliet, La Salle, de Tonti and other explorers. During his war with the Indians, Bienville, the French governor of Louisiana, built Fort Assomption here. This was taken by the Spanish, who later erected a fort of their own. The latter was surrendered to a force of United States troops in 1797, who built Fort Adams here.

The site of the present Memphis was the property of Judge John Overton, General James Winchester and General Andrew Jackson, and in 1819 these men laid out a town, giving it the name it still bears. Seven years later it was incorporated as a town, and a city charter was secured in 1849.

The city was decimated by epidemics of yellow fever in 1855, 1867, 1873, 1878 and 1879. The ravages of this disease were extremely severe in the two last named years. During the early part of the Civil War the city was damaged by the gunfire of the Union armies and fleet; the Union navy captured it in 1862 and held it until the war ended. Since the last visit of yellow fever, the water supply of Memphis has been purified, an adequate sewer system has been installed and other methods of safeguarding the public health have been adopted. In 1910 the population of Memphis was 131,105; in 1920, 162,351.

Memphremagog, mem-fre-ma'gog, a lake whose main body runs through the province of Quebec, Canada, and about a fifth of which, 7 miles, extends into the state of Vermont. In size it is about thirty-five miles long and four miles wide. It discharges its waters into the St. Francis, northeastward through the Magog river.

Memphremagog is one of the most picturesque of the New England and Canadian lakes and is visited by tourists from both countries. Ideal summer resorts are located all along its shores; quaint villas delight the eye of the traveller; steamer trips may be taken all along the American and Canadian shores. Fishing in this lake is excellent, and many are attracted by this feature alone. Barges are at all times to be seen on the water, carrying enthusiastic anglers.

The west shore is walled by a range of mountains reaching a height of about 3,000 feet. Owl's head and Elephant's head are the most prominent peaks. Newport, Vermont, the southern extremity, and Magog, Quebec, the northern, are the principal

towns on the lake and both are thriving places. Newport is widely known as a summer resort.

Mendel's Law, a law of hybrids. It is named from its discoverer, Johann Mendel, an Austrian monk, Abbot of Brünn, who lived 1822-1884. He carried on experiments in cross-pollenation of peas in the garden of the monastery. His observations were published in an obscure Brünn journal and were overlooked for a time. His chief conclusion, stated in an elementary way, is this: If the pollen from a red flower be used to fertilize the ovules of a blue flower, and the seed thus produced be planted, one-fourth of the plants will bear red flowers; one-fourth will bear blue flowers and one-half will bear hybrid blossoms, or blossoms of mingled red and blue. Now, if the seeds of the hybrid blossoms be planted,—we might naturally expect hybrid blossoms; but here is where Mendel's law really comes in; one-fourth of the plants thus produced will bear red flowers; one-fourth blue flowers, and one-half will bear hybrid flowers. Seeds of the red and of the blue flowers produce plants bearing red and blue flowers respectively, but the hybrids tend to split up into pure bred forms.

The tendency may be expressed in a table. Let us suppose that each seed produces a plant, and that each plant bears a single flower producing four seeds. If we plant the seeds of a single hybrid flower, and continue to plant all the seeds for five generations, we shall have flowers as follows:

	Red	Hybrid	Blue	Total
First planting.....	1	2	1	4
Second planting.....	6	4	6	16
Third planting.....	28	8	28	64
Fourth planting.....	120	16	120	256
Fifth planting.....	496	32	496	1024

The hybrids split into reds and blues, so that they only double in each generation; while the reds and blues not only quadruple, but they gain from the hybrids. The hybrids are one-half of the first crop, but they are only one-thirty-second of the fifth crop, and in a few more generations they become an insignificant part of the whole. The conclusion is that pure types tend to run out hybrids; or put in another way, hybrids tend to go back—to split up into pure strains.

Another portion of Mendel's law may be illustrated without a formal statement. If we are studying a hybrid of red and blue, and red be a strong, decided characteristic while the blue is of a delicate quality, red will predominate in the hybrid and three-fourths of the flowers of the first planting will be red or dominated by red, while the more delicate blue is characteristic of one-fourth only. In such case, blue is indicative of *pure* blood, while we cannot tell from color alone and without planting whether a red flower be a pure red or a hybrid. In such cases, red is called a dominant quality; blue is a recessive quality.

Mendel carried on observations covering many points other than the colors of petals. He observed differences in the form of ripe seeds,—wrinkled, smooth; color of seed albumen—yellow, orange, green; color of seed coat — gray, white, brown, spotted; form of ripe pod—inflated or compressed between seeds; color of unripe pod—light green, dark green, yellow; position of flowers; length of stem—nine inches to seven feet; etc.

Mendel's Law, as stated by him, refers to qualities, not to individuals. If, for instance, a tall red pea be crossed with a short blue pea, reverting to the table, we should have as before 496 red flowers and 496 blue flowers. We should have 496 pure long stems and 496 pure dwarf stems in the fifth generation, but half of the pure long stems would bear blue flowers, and half of the pure short stems would bear red flowers.

Nor is this the end of the matter. Red and length are dominant qualities. They are stronger than blue and a dwarf habit. The hybrids have long stems and red or reddish flowers. Still another consideration: we may find pure stems having hybrid flowers and hybrid stems bearing flowers of a pure color. A long stem and a red flower are not a guaranty of pure qualities. A long stem and a blue blossom are a guaranty of pure color only. A dwarf stem and a red flower are a guaranty of stem only. A dwarf stem and a blue flower will breed true every time. By keeping the strains separate, we may obtain a long stem and blue flower, and a dwarf stem and a red flower that breed true. In time the hybrids will run out, and we shall have the two old

types with which we started and the two new combinations of length and color. Now if we admit the shape of the pod, and have a long-stemmed, red-flowered, short-podded plant crossed with a short-stemmed, blue-flowered, long-podded plant, we shall have as many long pods as short pods in the fifth generation, but the number of plants having all three characteristics of either one of the ancestors is reduced again.

The probability of an offspring having all of a dozen characteristics of an ancestor becomes an interesting problem in mathematics. About all that is worth saying in this connection is that the plant that has bred back to blue flowers will produce only offspring having blue flowers; that is to say, the hybrid or medium color, size, length of stem, etc., tends to fade out. Starting with a red flower and a long stem and a blue flower and a short stem, it is not difficult to obtain a plant having a long stem and a blue flower that will produce its like. It is not difficult to breed a plant having a short stem and a red flower that will breed its like; but it is difficult to breed plants that have a medium length and are constant.

Mendel's law applies to animals as well as to plants. Dr. E. C. Schroeder of the United States Department of Agriculture has carried on experiments in crossing animals at the Bethesda station in the outskirts of Washington. He chose a rat all gray and a white rat with a black hood. His experiments have been continued for many generations. Tier after tier of rat cages are labeled with pedigrees. As expected, gray has proved the dominant color, and hooded white the recessive color. Of the first generation resulting from this cross every member was solidly gray like the dominant strain of the parents. This was as Mendel said it would be. Members of this generation were crossed. In this case the gray rats of the first generation produced part gray and part hooded. The hooded rat that had failed to make itself felt in the first generation showed in twenty-five per cent of the second. These hooded rats bred hooded in the following generations. A portion of the grays, twenty-five per cent, bred all grays, and a remaining proportion still having the unset characteristics repeating the proportions of the second generation. The experiment is going on still, and figures are being kept, but the length of it is already so great as to leave no doubt as to the findings, and they agree with those of the Austrian monk. Mendel's law is correct.

See MUTATION.

Mendelssohn, Felix (1809-1847), a German musical composer. He was born at Hamburg and died at Leipsic. He was the son of Hebrew parents of Lutheran faith. He was educated carefully and won wide reputation as director of the Leipsic concerts from 1835 to the time of his death. As the most noted musician of his day, Mendelssohn visited Berlin, Paris, England, Scotland, and Italy. Probably no musical composer of high merit received more immediate and more highly gratifying recognition than Mendelssohn. His oratorio of *Elijah,* in the preparation of which for the Birmingham, England, festival, he spent nine years, is considered his masterpiece. To distinguish it from another branch of the same family, the Lutheran branch took the name of Mendelssohn-Bartholdy; but the addition is seldom used in speaking of the great musician. Mendelssohn's family was not only musically talented, but it was refined and cultured. Felix received a broad and varied education, which was of great use to him in later life. He showed early signs of genius, and at twelve composed a very creditable piece of music. Both he and his eldest sister, Fannie, were under the instruction of the great Zelter, and both made rapid progress.

The first composition to receive great applause was his *Midsummer Night's Dream* overture in 1827. In 1828 he composed an overture to Goethe's poem, *A Calm Sea and a Happy Life.* He produced Bach's *Passion of Saint Matthew* in 1829.

In 1830 he began a tour of Europe, including Rome, Paris, and London. While in Rome he composed *First Walpurgis Night,* and *Italian Symphony.*

Mendelssohn married Cecile Jeañ-Renaud in 1837, and the union was a very happy one. His wife, the daughter of a

French clergyman, proved a sympathetic companion, and many of his triumphs were witnessed by her at his side. In 1841 he began to accept invitations to play before the royalty of Europe, both in England and Germany.

When Mendelssohn died in November, 1847, he was the idol of the musical world. He is one of the few genuises who was recognized in youth without a painful struggle for existence. Perhaps one of the reasons for this is that his compositions are very light and easily understood. His intriguing melodies easily catch the fancy of concert-goers, but for the most part there is no permanent value to them, and that is why few of them are now heard. He was bitterly opposed to Wagner's departure from form, but admired Bach and Beethoven.

Menelaus, in Greek legend, the king of Sparta. He was the brother of Agamemnon and the husband of Helen whose abduction brought about the Trojan War. Menelaus summonded his friends and allies to his support in a siege of Troy which lasted ten years. While the object of the war was attained, and Menelaus recovered his wife, he is by no means the heroic personage of the legend. His return occupied eight years of wandering. See ACHILLES; ULYSSES; HELEN; PRIAM; TROY, etc.

Meningitis, a term applied to inflammation of either of the meninges, or membranes covering the brain and the spinal cord. There are three of these membranes, namely, the "pia mater," next to the substance of the brain and spinal cord; the "dura mater," which lines the brain cavity and the spinal canal; and the arachnoid, which is a delicate weblike structure lying between the other two membranes. Cerebral meningitis is the specific term for an inflammation of the pia mater; cerebrospinal meningitis is inflammation involving the membranes of both the brain and the spinal cord. Spinal meningitis is inflammation of the membranes of the spinal cord.

Epidemic cerebrospinal meningitis was first described in 1805, since which time several severe epidemics of the disease have occurred in various parts of the world. The disease is said to be caused by a microorganism, known to physicians as Weichselbaum's diplococcus, present in the cerebrospinal fluid. The death rate from the disease is high, and even if recovery takes place, incurable deafness, blindness, paralysis, or mental feebleness may be left behind. The treatment said to have given the best results is by means of hot baths and the administration of large doses of sodium salicylate under the direction of a competent physician. Good results have been obtained by the injection of an antitoxic serum, and pathologists are ever on the search for the most effective remedies.

The epidemic disease is of an infectious nature and characterized in ordinary cases by an acute attack with violent headache, severe pains and stiffness in the neck, and great uneasiness, more or less fever, sometimes a chill, and sometimes vomiting. The subsequent course of the disease varies greatly, but usually presents severe headache and backache and retraction of the head, tenderness along the spine, often vertigo, stupor, frequently delirium, sometimes convulsions, sometimes vomiting, with paralysis of the ocular and facial muscles or abnormal stimulation of the same. The disease lasts from two to four weeks in many cases, but it may be fatal in a few days, or a severe attack may be followed by equally speedy recovery; and on the other hand, it may last for eight weeks or more. It is most frequent in children, but adults are not exempt. The infection usually is confined to localities, and proximity to or contact with the sick does not seem to increase the danger of contagion. A serum has been perfected which is successful in curing the disease.

Mennonites, a sect of Christians. They took the name from Menno, a religious reformer of the Netherlands. He lived 1492-1561. He taught the divinity of Christ, the propriety of adult baptism, the right of excommunication, the sinfulness of war, the impropriety of taking a formal oath, the uselessness of science, and the coming of a millennium. It was his aim to imitate the humility and nobility of Christ. His followers took the name about 1536. Various divisions of opinion and wholesale ex-

communications broke the church up into sects, a very general reunion of which occurred in 1811. The Mennonites appear to have extended into central Europe, and to have thriven with genuine Dutch industry until they were overtaken by the policy of enforced military service. At one time there were 20,000 in Moravia alone, but various European sovereigns drove them out or forced them into the army and into other church affiliations. In 1900 there were but 18,000 Mennonites in all Germany.

When the German rulers persecuted the Mennonites, Catherine II of Russia invited them to settle in her country. They were made welcome until toward the close of the nineteenth century, when they were given ten years' notice to leave the country or take their turn in serving in the army.

The sect is of special interest because so large a migration has reached the United States. Colonies were planted by William Penn at Germantown and elsewhere. Settlements grew up from time to time in Ohio, Maryland, Virginia, Indiana, and of late years leaders sent out to find new homes have located large parties of Russian Mennonites in Minnesota, North Dakota, and Manitoba.

Like the Lutherans, the Mennonites are divided into no less than a dozen independent organizations, having in all (1920) 982 churches, 1,398 ministers and 82,553 members. The people are noted everywhere for industry, thrift, and a disposition to avoid publicity.

See MORAVIA; ANABAPTISTS.

Mensuration, the art of measuring. Properly speaking mensuration is an application of geometry. Some of the common principles are the following:

The area of a triangle is equal to half the product of its base by its altitude.

The area of a square, rectangle, or parallelogram, is equal to the product of the base and altitude.

The area of a trapezoid is equal to half the product of the sum of the two parallel sides by the altitude.

To find the circumference of a circle, multiply the diameter by 3.1416.

To find the diameter of a circle, divide the circumference by 3.1416.

To find the area of a circle, multiply the square of the radius by 3.1416.

To find the surface of a sphere, multiply the square of the diameter by 3.1416.

To find the volume or contents of a sphere, multiply the surface by the diameter, and divide the product by 6.

To find the volume or contents of a cylinder, multiply the area of the base by the altitude.

To find the volume or contents of a pyramid, multiply the area of the base by the altitude, and divide the product by 3.

To find the volume or contents of a cone, multiply the area of the base by the altitude, and divide the product by 3.

Mentor, in Greek legend, the son of Alcimus and a faithful friend of Ulysses. He is mentioned frequently in the *Odyssey.* When Ulysses went to the Trojan war his domestic affairs were left in the care of Mentor. He took charge of the education of Telemachus, Ulysses' son. When Telemachus started in search of his father, Minerva assumed the form of Mentor and accompanied him, acting as counselor in times of difficulty or danger. The French writer, Fénelon, in *The Adventures of Telemachus,* develops the character of Mentor to such an extent that the word has come to be used metaphorically to designate a faithful monitor who is ever at hand to warn or advise.

Mephistopheles, mĕf-ĭs-tŏf'ĕ-lēz, in medieval legend, a demon or devil. The companion and attendant of Faust during his twenty-four years of pleasure. The name has been spelled variously, but Goethe's spelling in his drama of *Faust* is the one universally adopted at present. The etymology of the word has also been explained variously. Bayard Taylor is of the opinion that the word was formed irregularly from the Greek words: *Phos,* light, and *Philos,* love, with the negative *me,* and means "not loving the light." Goethe not only gave a new spelling to the old word, but he gave a new character to this evil spirit. Marlowe's Mephistopheles, in his *Dr. Faustus,* was a melancholy, servile creature; but Goethe's is a cold, intellectual, scoffing fiend. While his name is used frequently to designate the devil, to one who has read *Faust* or seen it well pre-

sented, Mephistopheles is a distinct personality with little in common with the old conception of Satan. See FAUST.

He is the devil not of superstition but of knowledge. Such a combination of perfect understanding with perfect selfishness, of logical life with moral death, so universal a denier both in heart and head, is undoubtedly a child of darkness, an emissary of the primeval Nothing, and may stand in his merely spiritual deformity, at once potent, dangerous, and contemptible, as the best and only genuine devil of these latter times.—Carlyle.

Mercator (1512-1594), a celebrated Flemish geographer. He studied at the University of Louvain and devoted himself to lectures on geography. He was noted for his skill in constructing charts and apparatus wherewith to make his lectures clear. He attracted the attention of Charles V and was made for a time a member of his household. While in the emperor's employ he constructed two celebrated globes of great size, one of glass, representing the heavens, the other of wood, representing the earth. In 1578 he published an edition of *Ptolemy's Geography*, accompanied by an atlas. Some of the geographical views advanced were condemned by the church as heretical. Mercator is known to the schoolboy chiefly for the invention of the so-called Mercator's map or projection. In these maps the meridians cross the parallels at right angles, instead of approaching each other as they recede from the equator. This method is sufficiently accurate for a map of a county, but, when applied to large areas, the end which is farthest from the equator is widened unduly from east to west. See GEOGRAPHY.

Mercerizing, in the manufacture of textiles, a process of treating cotton yarn or fabrics with chemicals by which they are made stronger and are given a luster or gloss. The chemicals employed in the mercerizing process are usually caustic soda and sulphuric acid. John Mercer, by whom the original method of caustic soda treatment for cotton was invented, was an English calico printer. He was seeking for a method which would produce upon cotton goods an effect similar to that produced on woolen goods by fulling. He hoped he had discovered what he wanted when he found that strong caustic soda had a decided shrinking effect upon cotton goods, increasing the weight thereof. Mercer patented his process and named it mercerizing, but it proved of little value, the loss in shrinkage not being counterbalanced, in the opinion of manufacturers, by the gain in strength and weight. Moreover, the caustic soda was expensive.

The next step in the story of mercerizing is a peculiar one. About 1885 worsted crépons and other goods showing crinkly effects were very fashionable. They were woven with two warps, the back warp being of cotton and held at greater tension than the face warp. While the popularity of these goods was at its height, a novelty goods was brought to this country from France, which completely eclipsed the home product. In this French fabric the crape effect was greatly exaggerated, the crinkles having become veritable puffs. American manufacturers tried in vain to reproduce this material. Not until the fabric was long out of fashion was it discovered that the French had taken advantage of the decrease in price of caustic soda and mercerized this fabric. The goods had been woven in a manner similar to that used for the American crépons. The mercerizing caused the cotton backing to shrink greatly, leaving the worsted warp threads of the face in great puffs. In 1897 a firm of German dyers wished to dye a fabric of cotton and silk. Finding that the cotton did not take the dye as did the silk, they concluded to try the mercerizing process, and, lest too much be lost by shrinkage, to stretch the goods and mercerize it while stretched. Their success was astonishing, for they not only accomplished the end aimed at, but found that their cotton had acquired a luster equal to that of silk.

Since that time mercerizing under tension has become very common, and in its effect has been almost equal to the discovery of a new fiber. The mercerizing is done usually in the yarn. With a moderate increase in expense the beauty and variety of cotton goods has been extended. The mercerizing of yarns under tension results in a change in the structure of the fiber. Cotton fiber under the microscope appears as a flat, twisted ribbon. Mercerized, it instantly swells, untwists, becomes firm and round, and loses its cuticula or outer skin, becom-

ing thereby more glossy. The rounded form of the fiber after mercerizing causes the rays of light to be reflected from the surface of the fabric, increasing the luster. Only the better grades of cotton, as the Sea Island and Egyptian, can be mercerized to advantage. A genuine mercerized fabric can be distinguished readily from one in which the glossy appearance has been produced by calendering. If a sample be subjected to a hot water bath and dried, gloss produced by calendering will disappear; but the luster of genuine mercerized goods is permanent.

Merchant Marine, a general term for the commercial shipping of the world; or in a limited sense, for the merchant vessels sailing under the flag of any particular country. The term is used to express the distinction between the government-owned vessels constituting the official navy of a country, or the combined navies of the world, and the whole body of shipping, usually privately owned, that is engaged in trade and commerce or the service of transportation. The term *merchant navy* is sometimes used in connection with the merchant marine of a given country; also *mercantile marine.*

In 1922, according to Lloyd's Register, the merchant marine of the world included 29,255 steam and motor vessels and 4,680 sailing vessels of 100 tons or more. The total tonnage of the steam and motor vessels was 61,342,952; of the sailing vessels, 3,027,834; making a grand total of 33,935 ships and 64,370,786 tons. Of the steamers and motor vessels, 23,250 were of steel construction, 2,625 of iron, and 3,380 of wood or composite wood and iron. Of the sailing vessels, 966 were steel, 299 iron, and 3,415 wood or composite. These vessels carry on the international trade and coastwise traffic of the wold.

The United States merchant marine now stands second among the commercial fleets of the world. When the European war broke out in 1914, Department of Commerce statistics gave this country seagoing tonnage of 1,837,000, against 18,877,000 for Great Britain, 5,098,000 for Germany, 1,918,000 for France, and 1,642,000 for Japan; the world's total tonnage of merchant shipping at that time being 42,514,000. By 1921 the situation had entirely changed. The United States then had a seagoing tonnage of 12,314,000; Great Britain, 19,288,000; France, 3,045,000; Japan, 3,063,000, and Germany, 654,000; the world's total being 54,158,000 tons. These relative positions were unchanged in 1922, but Germany had increased her tonnage of seagoing vessels to 1,783,000, and the world's total was 56,802,000 tons.

Merchant shipping under construction June 30, 1922, according to Department of Commerce figures for the leading maritime countries was as follows: United States, 150,623 tons; Great Britain, 1,919,504; France, 243,290; Japan, 115,512; Germany, estimated, 500,000; total for all countries, 3,325,430 tons.

The United States Shipping Board was established by act of Congress approved Sept. 7, 1916, as a war measure, "for the purpose of encouraging, developing, and creating a naval auxiliary and naval reserve, and a merchant marine to meet the requirements of the commerce of the United States with its territories and posessions and with foreign countries; to regulate carriers by water engaged in the foreign and interstate commerce of the United States, and for other purposes." The Board, consisting of five members, was authorized to construct and equip, or to purchase, lease, or charter, vessels suitable for use as naval auxiliaries in time of war, "so far as the commercial requirements of the commercial trade will permit, domestic yards to be given the preference in such construction, other things being equal, and may charter, lease, or sell such vessels to any citizen of the United States, under regulations to be approved by the President." The preliminary sum of $50,000,000 was placed at the disposal of the Board, and its existence was limited to five years from the close of the World War.

An era of intense activity in shipbuilding then began in the United States and continued until the Armistice in November, 1918. The merchant fleet was immensely increased, and the United

States took second rank among the nations in this respect. Visions of a return of the former position of American shipping in world commerce were indulged in, but the subsequent policy of Congress, which defeated government proposals to subsidize and otherwise encourage merchant shipping, had a deterrent effect upon shipowners and hundreds of the newly-built merchant ships were permitted to lie rotting at their docks and moorings.

Operations of the Shipping Board and its policy were summarized in an official statement issued September 1, 1922, as follows:

> The general policy of all provisions of the Merchant Shipping Act, 1916, and of the Merchant Marine Act, 1920, contemplates sales of vessels to citizens, to the exclusion of foreigners, except when the Board regards particular vessels proposed to be sold to foreigners as of unimportance to the American merchant marine.

Fifty-two per cent. of the total cargo tonnage handled in United States ports in the fiscal year ending June 30, 1922, moved under the American flag, when 37,312 vessels in water-borne foreign commerce, aggregating 80,231,000 long tons, entered and cleared American ports, 49 per cent. of the vessels being of American registry.

The Emergency Fleet Corporation, a subsidiary of the United States Shipping Board, expended during the war period, in the construction and purchase of ships, and for other purposes, a grand total of $3,313,664,069. The Board established trade routes to several European ports, to India, Australia, the Orient, South America, the West Indies, the Dutch East Indies and the east and west coasts of Africa, and on September 1, 1922, the Board owned 1,657 vessels of a total tonnage of 11,574,416. These included the following ships: Steel cargo, 1,225; passenger or passenger and cargo, 42; transports, 5; refrigerator ships, 13; tankers, 81; tugs, 30; wood cargo, 237; concrete, 9; composite, 11. There were 882 cargo ships inactive on that date, also 17 cargo and passenger ships, 13 refrigerator ships, and 66 tankers.

On September 12, 1922, of the wooden vessels built as a part of the war program, 226 were sold at auction for $750,000, or about $3,300 apiece, and 110 wooden vessels remained in the hands of the Shipping Board.

When the United States entered the World War, 103 German vessels interned in American ports were taken over, with a total tonnage of 611,799 deadweight tons. All of these were repaired, including many that had been seriously damaged by their former German crews, and they were placed during the war in the service of the United States army or navy, or the allied governments. In addition, 14 Austrian interned ships were acquired for the service of the United States and its associates. Some of these vessels are now in regular service as part of the American merchant marine.

Merchant of Venice, The, a comedy by Shakespeare, written sometime between 1594 and 1598, and printed in 1600. The date of the first presentation is unknown. The material of the play was obtained in part from the *Gesta Romanorum.* Two stories seem to be united in *The Merchant of Venice.* The one, *The Pound of Flesh,* or *The Bond Story,* represents a merchant as having borrowed money, signing a bond that, if the debt is not paid at a certain date, the creditor may cut from his debtor's body a pound of flesh. The other is the story of *The Three Caskets,* one of gold, one of silver, one of lead. In one of these there is a treasure which he may possess who chooses the right casket. The first of these stories has been traced as far back as the *Mahabharata,* the great epic of India. Both stories are found in the *Gesta Romanorum.* Both have been told and retold in many languages, before and since the time of Shakespeare. It is believed that Shakespeare made use of an Italian novel for his version of *The Bond Story.* The character of Portia in this play is a favorite among Shakespeare's creations. Schelling speaks of her as "the sound-hearted, adorable . . . a creature of the poet's brain, wealthily endowed with a reality and an immortality beyond the fondest longings of actual men and women." Shylock, too, is a striking character, and in the presentation of the play is the figure about whom interest centers.

What then remains to Shakespeare? and what is there to show that he is not a plagiarist? Everything that makes *The Merchant of Venice* what it is. The people are puppets, and the incidents are all found in old stories. They are mere bundles of barren sticks that the poet's touch causes to bloom like Aaron's rod: they are heaps of dry bones till he clothes them with human flesh and breathes into them the breath of life.—Richard Grant White.

Mercier, Desiré Joseph, Cardinal (1851-1926), Archbishop of Malines, Belgium, was born at Braine-l'Alleud, Belgium. He studied at Malines, and later was ordained priest, after which he resumed his studies, this time at Louvain. In 1877 he was appointed professor of philosophy at the seminary of Malines.

In 1906 Monsignor Mercier was appointed Archbishop of Malines to succeed Archbishop Gossens, and in 1907 he was made a cardinal. In 1914, on the outbreak of war, he was called to Rome, and on his return wrote the famous *Patriotism and Endurance* letter. This embodied his protest against the German invasion. During the whole four years of the German occupation he did not cease to protest agaist it, as his correspondence shows. He succeeded to the extent that political prisoners were freed, and his courageous patriotism was highly praised.

Mercier, Honore (1875-), a Canadian statesman, was born at St. Hyacinthe, Quebec, and was educated at St. Mary's College and at Laval University, Montreal. Called to the Quebec bar in 1900, Mr. Mercier built up a large practice, and in 1907 he was elected to the Quebec legislature, serving until 1916. In 1906 he was made an alderman of Montreal, and was reelected to that office in 1908, and in 1914 he was appointed a member of the Gouin cabinet. During his term in the legislature Mr. Mercier won an enviable reputation for statesmanship.

Mercury. See HERMES.

Mercury, the planet nearest the sun. From its position, the Greeks gave this planet the appropriate name of Mercury, winged messenger of the gods. It is so near the sun that it appears as an evening or as a morning star. As a morning star it is seen to better advantage in March and April. It is a brilliant evening star in September and October. Mercury is the swiftest, the smallest, and the lightest of the planets. It has no satellites. It rotates once in eighty-eight days, the length of time required to pass around the sun; that is, a rotation for each revolution. It occasionally passes between the earth and the sun. A transit occurred in 1894, and another in 1907. See SATURN; PLANETS.

Mercury, an important metal. It is found in a pure state to some extent, but usually in combination with sulphur, from which it is separated by roasting. The ore, called cinnabar, is found chiefly in Austria, Spain, and California. It is noteworthy that the greatest American supply of mercury should have been discovered in California during the gold excitement at the very time and place it was most needed. Otherwise the miners would have been at the inconvenience and expense of obtaining mercury from far away Spain.

When cinnabar is roasted to a temperature of 357.25° F., the mercury rises in a vapor and is caught and condensed. Ordinary mercury, or quicksilver, is a dense liquid, 13.6 times as heavy as water. It is sensitive to change of temperature and is much used in the construction of thermometers. It freezes at —39.5° F. The union of mercury and any one of several metals is called an amalgam. Placer miners nail slats across their troughs or sluices, above which they pour a little mercury. The rolling grains of gold are heavy and are caught by the mercury, forming a gold amalgam from which the mercury is separated by heat and used again. Tin amalgam is used extensively in coating the backs of mirrors. Mercury is used in the manufacture of the explosive substances of gun caps.

In corrosive sublimate mercury is a rank poison. Calomel is a preparation of mercury much used in medicine. Mercury, taken in excess, remains in the system, enters the bones, and rots them. In the Austrian cinnabar mines the extreme limit of life is six years. It is said the bones of the skeletons of the miners are so loaded with mercury that quicksilver can be shaken from them.

One of the most noted uses of mercury is

its employment in the making of barometers. Under ordinary conditions, a thirty-inch column of mercury at the sea level is about as heavy as a similar column of air extending to the upper limits of the atmosphere.

Producers put up mercury for sale usually in flasks of seventy-six and one half pounds. About 100,000 flasks are produced yearly, of which, roughly speaking, Spain furnishes a half, the United States a fourth, Austria and Italy the remainder.

See PLACER MINING; BAROMETER.

Mer de Glace, a famous glacier of Switzerland. It flows from the north shoulder of Mount Blanc to the valley of Chamounix—a stream of ice two miles wide and nine miles long. The flow in the summer season is about an inch an hour. It is the best known glacier in the world. It has been studied by scientists for centuries. See TYNDALL; AGASSIZ.

Meredith, George (1828-1909), an English novelist. He was born in Hampshire. He received his education in Germany but returned to England to study law. He began his literary labors with poetry, but soon took to writing stories. His first novel of importance was *The Ordeal of Richard Feverel* which appeared in 1859. Other novels are *Evan Harrington, Rhoda Fleming, The Egoist, The Adventures of Harry Richmond*—probably his most popular story—*The House on the Beach,* and *Diana of the Crossways.* While not popular with the average reader, Meredith's novels are liked by those who appreciate the discussion of difficult social problems. They are ranked high by the critics, who place Meredith with Thomas Hardy as one of the greatest novelists of his time.

Meredith, Owen. See LYTTON, EDWARD ROBERT BULWER.

Meredith, Sir William Ralph (1840-1923), a Canadian jurist, was born at Westminster, Ontario, and was educated at the University of Toronto. In 1861 he was called to the bar and was elected to the Toronto legislature in 1872. Three years later Sir William was appointed Queen's Counsel. He led the Conservative opposition in the provincial legislature from 1879 to 1894. In the latter year he was made justice of the Ontario High Court of Justice and was knighted in 1896. Sir William identified himself with many very progressive movements in Canada. He was one of the first advocates of manhood suffrage; he fought for workmen's compensation; and he clearly enunciated the principle that the placing of a political head over the educational system makes that system a political machine. In 1905 he was a member of the Royal Commission to investigate the affairs of Toronto University. He was made Chief Justice of Toronto in 1912. In 1900 he was appointed to the position of chancellor of the University of Toronto.

Mergenthaler, mĕr'gan-tä-ler, **Ottmar** (1854-1899), a German-American inventor. He was born in Wurtemburg and died in Baltimore. Educated as a watchmaker, he came to this country in 1872 and became a repairer of clocks and electric bells in the government buildings at Washington. He also made himself useful in perfecting the instruments of the signal service. In 1876 he resigned and took up his residence at Baltimore, giving his attention to the invention of a typesetting machine. After repeated changes of plans he produced the Merganthaler linotype. See LINOTYPE.

Meriden, Conn., one of the most prosperous industrial centers in New England, is situated 18 miles south and west of Hartford, on several railroads. Harbor Brook runs through the city, draining the uneven ground, and near the city the Hanging Hills rise to a height of more than 1,000 feet. Chief among Meriden's numerous manufactures are silverware, cutlery, steel pens, cut glass, hardware, agate ware, self-playing attachments for pianos and organs, electrical goods, tin ware, woolen ware, firearms and optical instruments. It contains the Curtis Home for Orphan Children and Aged Women, the Connecticut School for Boys, the Curtis Memorial Library, a fine armory and modern public schools; and near the city is a natural reservation of 900 acres. The population was 29,867 in 1920.

Meridian, the metropolis of Mississippi and the county seat of Lauderdale County, is 96 miles east of Jackson, the capital,

and 135 miles northwest of Mobile. It is served by the Southern, the Mobile & Ohio, Meridian & Memphis, Alabama & Vicksburg, Alabama & Great Southern and New Orleans & Northeastern railroads.

This city is an important commercial center and is also the principal manufacturing center of the state. It is situated in an agricultural region that produces large quantities of cotton and fruit. The industrial plants produce cotton-seed oil and cake, wagons, staves, fertilizer, brooms, hosiery, lumber, mattresses and machine shop and foundry products. Several of the railroads maintain building and repair shops here.

The educational system of Meridian comprises, besides good primary and high schools, the Haden Institute (for colored students) and a Carnegie library. Notable among the city's buildings are the court house, city hall, post office, and the East Mississippi Hospital for the Insane.

Meridian was chartered as a city in 1860; it was one of the most important Confederate railroad centers during the War of the Secession, and was taken by General Sherman in 1864. The commission form of government was adopted in 1912. Meridian had 23,285 inhabitants in 1910, and in 1920 these had only increased to 23,399.

Meridian. See LONGITUDE.

Merino, mĕ-rē′nō, an important breed of sheep. It is supposed to have originated in Asia Minor, but it reached its highest development and received its name in Spain. The ram in particular has strong limbs, spiral, drooping horns, and a wrinkled neck. The merino fleece is long, soft, and twisted. The fibre is noted for its silky fineness. Merinos have been distributed all over the world. They now constitute a large part of the flocks of Australia, and have been introduced widely into the United States. The heavy fleece, docility, and ability to thrive on coarse food and to withstand cold weather have made the merino a favorite on the ranges. See SHEEP.

Merlin, mer′lĭn, in British legend, a celebrated prophet and enchanter who figures prominently in the stories of King Arthur. Merlin was supposed to have flourished toward the latter part of the fifth century. According to the legend, he was the son of a demon and a British princess, and was rescued from the power of Satan by receiving Christian baptism as an infant. He became an adept in magic and was the greatest sage of his time. He was beguiled by the enchantress Nimue, who buried him under a rock. Another story is that Vivien, the Lady of the Lake, became his mistress. She brought him entirely under her magic power and finally imprisoned him in a thorn bush from which he was unable to escape. Tennyson mentions Merlin in his Arthur tales. It was Merlin who instituted the order of the Knights of the Round Table. See ARTHUR; IDYLLS OF THE KING; ROUND TABLE.

Merovingians, or **Merwings,** the first dynasty of the Frankish kings in Gaul. The name is derived from Merwig or Merovech, king of the western or Salian Franks, from 448 to 457. To his grandson, Clovis, is due the establishing of the fortunes of the dynasty which in 751 was succeeded by the Carolingians. By degrees the power of the Merovingians dwindled. Clovis had four sons, to each of whom he allotted a fourth of his kingdom. One of the four, Clotaire II, reunited the kingdom in 613. The power of the Merovingian kings waned, however, and the dynasty ended with the deposition of Childeric III by Pepin the Short, in 751.

Merry Del Val, Rafael (1865-), a Roman Catholic church dignitary, born in London, was educated in England and Rome. He took orders in 1888, and in 1892 was made papal chamberlain. He was consecrated Bishop of Nicaea in 1900, and later succeeded Cardinal Rampolla as papal Secretary of State. He was made a cardinal in November, 1903. In 1914 he was appointed secretary of the congregation of the Holy Office and Archbishop of the Vatican Basil. He wrote *The Truth of the Papal Claims.*

Mesopotamia, mĕs-o-pō-tā′mĭ-a, the wide, low plain between the Tigris and the Euphrates. The name is Greek signifying the land between the rivers. Once it was a marvelously productive region, the seat of the earliest civilizations. The Assyrians

dug canals and built aqueducts. One irrigation canal was 480 miles in length. Herodotus, who visited the delta of the Nile, traveled also in Mesopotamia. He stated that he dared not describe the wondrous fertility of this region lest he be set down as untruthful. Ancient writers called this valley the "Garden of the Lord." Wheat was the main crop. Oranges, lemons, pomegranates, apricots, figs, grapes, apples, pears, quinces, plums, cherries, melons of many kinds, chestnuts, filberts, and other nuts, grew in abundance. The gardens of the people yielded beans, peas, lentils, onions, cucumbers, spinach, and indeed, most of the garden products we raise in the United States. Ancient Chaldea, Babylonia, and Assyria lay wholly or in part in Mesopotamia. The region has belonged at various times to the Assyrians, Persians, Greeks, Syrians, Parthians, Romans, Saracens, and Turks. It is now known as Iraq. Bagdad is its chief city. Extensive irrigation canals and railroads bid fair to rescue large sections from the sand that has drifted in and damaged the country.

During the World War, Mesopotamia, under Turkish control, was conquered by Indian and British troops. In the Peace Treaty with Turkey, Iraq was recognized as an independent state, under the mandate of Great Britain. It is governed by a king and cabinet, a British commissioner representing the mandate.

Mesopotamia is a land of promise. Oil is the chief product. Asphalt deposits have been located. The soil is rich and agriculture is being developed, especially by irrigation. Wheat, barley, cotton, dates and ground nuts are produced, and cotton goods forms half the imports of the country, sugar being second. Carpets and grain are the principal exports.

The principal seaport is Basra, at the head of the Persian Gulf. Before the war the rivers Tigris and Euphrates were the only means of communication with Bagdad and other parts of the country. During the war railways were built from Basra to Nasiriyah, on the Euphrates, 140 miles; Basra to Amara, on the Tigris, 109 miles; and Kut-el-Amara to Bagdad, 105 miles. A train ferry connects the left and right banks of the Euphrates. There were in 1927, 6,300 miles of telegraph lines and 465 miles of telephone lines. See IRAQ.

Mesozoic Era, one of the great divisions of geologic time, succeeding the Paleozoic era and preceding the Cenozoic era. It is subdivided into the Triassic, the Jurassic, and the Cretaceous periods.

Mesquite, mĕs-kēt′, a useful shrub or tree of the legume order, common in the dry southwestern section of the United States, where it originated, and as far south as Chile and the Argentine Republic. It is found also in the Hawaiian Islands, to which it was carried by missionaries. Other names for the mesquite are honey locust, cashaw, algaroba, and honey pod. The leaves are pinnate, the flowers small, borne on spikes, and rich in honey; the fruit is a pod containing seeds rich in sugar, and when ground forms good food for stock. The tree produces drops of clear yellow gum used in making mucilage, candies and in the laundry.

Messina, the chief town and seaport of Sicily. It is situated on the Strait of Messina which separates Sicily from the mainland. The harbor has the shape of an old-fashioned grain sickle, and is considered one of the safest and most commodious in the Mediterranean. The climate is agreeable, the temperature averaging 66° F. In 1908 Messina suffered an earthquake which was attended with a frightful loss of life. Over 200,000 persons perished in the city and adjacent districts. Messina was at once rebuilt, and now is modern in every way. It ranks seventh in importance of the Italian cities. The chief exports are oranges, lemons, citrons, wines, nuts, pumice stone, linen, silk, ornaments of coral and fine damask.

Messina is a very old city, its foundation dating as far back as the seventh century B. C. It was originally called Zancle (a sickle), but about 500 B. C. the Greeks changed the name to Messina. The city has had many disasters aside from its numerous earthquakes, for it has suffered devastating wars. At the end of the Punic War it passed into the possession of the Romans, and after the decline of Rome it belonged successively to the Saracens,

Normans, and Spaniards, but since 1861 has been a part of Italy. Pop. 150,000.

Metabolism, mē-tăb'o-liz'm, from a Greek word meaning "a change," a term used to denote all physico-chemical processes connected with the growth and nutrition of an organic body. It has been divided into constructive metabolism (anabolism) and destructive metabolism (katabolism). By the former process food is converted into protoplasm or living substance, while katabolism is the means by which that substance is broken down into simpler form such as excretory or waste matter. Thus it is seen that metabolism comprises all elementary changes of form, substance, and energy connected with plant and animal life. Warm-blooded animals undergo a decrease under heat; hence a man in winter has a much more active metabolism than in summer, because at a lower temperature, he consumes more food.

Metals, including about fifty out of the eighty elementary substances. They are distinguished from the others, the non-metals, by being opaque, generally solids, heavy, white in color, insoluble in water, fusible, malleable, and good conductors of heat and electricity. To all these there are exceptions, however, as mercury, which is a liquid; sodium, potassium, magnesium, and aluminum, which are light; gold, yellow; copper, reddish, etc. This classification into metals and non-metals is not recognized as of any great chemical significance. The gradations and overlapping is too considerable. Valence, or combining power, and electro-chemical behavior, are more accurate bases of classification for the purposes of the chemist. See CHEMISTRY.

Metallurgy, the science which treats of the separation of metals from their ores. Those metals that are found free, need only to have their ores crushed and the rock separated mechanically, whereupon the metal may be melted up and refined. Oxides, the largest class of ores, are smelted with coke and a flux, the former to take up the oxygen and the latter the rock. Sulphides, next in importance, must in general be roasted first to drive off the sulphur, when they are smelted as oxides. Low-grade ores are often concentrated, that is, a part of the rock material removed, before smelting. For most ores special methods have been found economical. Gold ores, for instance, may be treated by the cyanide or by the chlorination process, zinc as well as mercury by distillation, aluminum by an electrical process, etc. See IRON; COPPER; GOLD; ETC.

Metaphor, a familiar figure of speech in which one object is spoken of in terms of the other. The basis of the metaphor is some point of resemblance between objects essentially different. For example, a storm and a bird are essentially different. They resemble each other in that both sweep over our heads and finally become quiet. Wordsworth makes use of this fact in a metaphor when he writes:

And the wild storm hath somewhere found a nest.

Had he stated the likeness in so many words; as, the storm ceases like a bird that has found its nest, his figure would have been a simile.

In his farewell to his sons, Jacob made repeated use of metaphor. "Judah is a lion's whelp," "Dan shall be a serpent by the way," "Naphtali is a hind let loose," and "Joseph is a fruitful bough" are illustrations.

Metaphorical expressions are of such frequent occurrence in common conversation that many of them pass unnoticed. Among these common metaphors are such expressions as: golden harvest, howling mob, polished speech, man of iron, wrinkled care, broad-armed elms, burning desires, storm of life, seeds of pride, rugged style, morning of life, pearl of charity, tide of tyranny, roaring torrent, anchor of hope, ocean of life, tyranny of fashion. In an extended metaphor, the expression of resemblance is continued through a series of phrases or sentences, and may extend through several paragraphs and even through an entire chapter. The following quotation, in which man is likened to an insentient object in nature, is a good example of an extended metaphor:

This is the state of man: today *he puts forth*
The tender leaves of hope, tomorrow *blossoms*
And bears his blushing honors thick upon him;
The third day *comes a frost, a killing frost,*
And,—when he thinks, good easy man, full surely
His greatness is a ripening,—nips his root,
And then he falls as I do.

Metaphysics. See PHILOSOPHY.

Metcalfe, Charles Theophilus, (1785-1846), a British statesman and colonial administrator, was born in Calcutta, India, but was educated in England. He returned to India in 1800 and entered the service of the East India Company, with which he served for thirty-eight years. In 1827 he was made a member of the supreme council of India and served as temporary Governor-General of India in 1835. During his one year in this office Baron Metcalfe instituted a number of reforms in India; the most important was the granting of freedom to the Indian press. He resigned from the East India Company in 1838 because he was out of sympathy with the harsh treatment accorded the natives by the Company's officers.

In 1839 he was appointed governor of Jamaica, and in this position he was successful in establishing amicable relations between the Negroes and the planters. Returning to England in 1842, he was appointed Governor-General of Canada in 1843. His political training had been such that he was wholly unfitted to govern a people whose ideal was democracy and responsible government. The role he had played in India and Jamaica was that of a benevolent autocrat; this attitude was inimical to the Canadian temper, and the new Governor-General was soon in conflict with the assembly because of his refusal to consult the executive council on the question of appointments. The Reformers were in power when Baron Metcalfe went to Canada, but their defeat in 1844 allowed him to choose a cabinet that was more to his liking. Still affairs did not go well, for he was out of touch with the new spirit in Canadian politics. In 1845 he resigned and returned to England.

Metchnikoff, Elie (1845-1916), one of the greatest of biologists, was born in the province of Kharkov, Russia, and was educated there and in Germany. He held the chair of zoology at the University of Odessa from 1870 to 1882, and in 1892 he was appointed to the Pasteur Institute. Previously, in 1884, he made known his remarkable theory that blood congestion in a wound is caused by a struggle between the white or ameboid corpuscles of the blood and the disease germs in the wound. This was but one of his contributions to science. He insisted that a better knowledge of human physiology and pathology could be gained by a study of the lower animals, and greatly advanced the science of bacteriology. In 1895 he was made subdirector of the Pasteur Institute, and in 1908 he shared with Paul Ehrlich the Nobel prize for medicine. Much of Metchnikoff's later life was spent in studying the decay that is commonly known as old age. He attributed to intestinal putrefaction many of man's ailments and his decay with age, and proved at least partially that ordinary sour milk and other but more subtle lactic ferments are valuable preventives of the conditions mentioned above. He wrote *The Prolongation of Life, The Nature of Man, Immunity in Infective Diseases* and numerous other valuable works.

Metempsyschosis. See TRANSMIGRATION.

Meteorites, me'te-er-itz, or **Aerolites,** bodies falling upon the earth from outer space. Sometimes one meteoric stone falls; sometimes there are many fragments. A meteoric shower of 1869 was estimated to contain 100,000 small pieces. The fall of a meteor is usually accompanied by a roaring noise with repeated loud reports ending in a grand explosion that may be heard possibly forty miles away. The largest meteor known until of late weighed 647 pounds. Their weight is perhaps overestimated.

Twenty-seven chemical elements, but no new ones, have been found in meteorites. Some are pieces of iron alloyed with nickel. The prevailing element is iron. The surface is covered usually with a glossy crust formed by fusion of the surface in falling through the air. Saws, working with emery dust and run by machinery, are sometimes occupied for weeks in cutting through a single meteor a foot in diameter.

No one knows where meteors come from. It has been suggested that they were thrown out of the extinct volcanoes of the moon ages ago, and no doubt they do come from some of the heavenly bodies. Wherever they come from, it is very likely they have been in space for millions of years and

come within the influence of the earth only accidentally. Good authorities are of the opinion that several hundred meteors fall annually. About 275 newly fallen meteorites were placed in cabinets during the nineteenth century. About thirty of these fell within the United States from Connecticut to Arkansas. Yale University possesses the finest collection in this country. The finest collection in the world is that at Vienna.

A popular belief that stones do fall from the heavens may be traced to the ancients. Scientists were disposed to scout the idea until 1803. In April of that year between 2,000 and 3,000 meteoric stones fell in the vicinity of L'Aigle, France. The shower covered an oval area nine miles long by three wide. All doubts were dispelled. For an account of meteors which melt in the air before reaching the earth, see article on SHOOTING STARS

Meteorology, the science which treats of the earth's atmosphere. It is of comparatively recent development, and on the practical side is of the greatest importance. All the leading nations have given it particular study under a department of the government. While the subject may include anything connected with the atmosphere, the study of conditions affecting weather and climate receives most attention. See WEATHER BUREAU.

Meter. See METRIC SYSTEM.

Methodists, a body of Protestants, the leading denomination of which is known formally as the Methodist Episcopal church. Methodism originated in England. Its founders were the brothers John and Charles Wesley. The former organized the first Methodist society in 1739. So far as known, the first Methodist settlers of the New World were a company of Irish emigrants who arrived at New York in 1760. They built a chapel on John Street. Another settlement of Methodists was made at about the same time in Frederick County, Maryland. The first American Methodist conference met in the city of Philadelphia, July 14, 1773. Francis Asbury, the first superintendent of Methodist churches, that is to say, the first American bishop, was present. There were nine preachers in attendance. The churches reported a total membership of 1,060. The Methodist church grew most rapidly in the South. John Wesley, himself, visited Savannah in 1736. The question of slaveholding gave the Methodists much concern. The early church appears to have been nearly unanimous in opposition to slavery. In 1844 a crisis arose. A Southern bishop by the name of James O. Andrew, a man of great popularity and undoubted integrity, was suspended from duty by the general conference until such time as he might disentangle himself from the holding of slaves, acquired, it is said, by marriage. The Southern members of the conference seceded and organized the Methodist Episcopal Church South. The division has continued up to the present time. The two branches are now upon the most amicable terms. There is every expectation that they will reunite at no distant date. The Southern Church (1924) had 17,504 churches and 2,362,598 communicants. The Northern Church had 29,232 churches and 4,235,216 communicants. There are, in addition, colored churches, reporting a total membership of about a million and a half.

The parent organization, the Methodist Episcopal church, has become a denomination of great wealth. It maintains in whole or in part, over fifty colleges, besides many academies. Wesleyan University at Middletown, the Northwestern University at Evanston, Ohio Wesleyan at Delaware, Boston University, and Syracuse University are the leading institutions. The Methodist Book Concern is devoted largely to the publication of hymn books, memoirs, reports, Bibles, and Sunday-school books. It also publishes a number of periodicals, notably *The Christian Advocate, The Methodist Review,* and *The Epworth Herald.* It has prospered beyond expectation, having now a capital estimated at $3,000,000. The denomination maintains a large number of missions in China, Japan, India, Africa, the various countries of South America, Italy, and northern Europe. There are a million Methodists in Canada, half a million in England, and 10,000 in Ireland.

See ASBURY; EPWORTH LEAGUE; WESLEY.

Methuen, Mass., an industrial town in Essex County, is 30 miles north of Boston. It has a delightful location on the Spicket and Merrimac rivers, and is served by the Boston and Maine Railroad. It has textile mills producing hosiery, yarn, cotton and woolen goods, etc., and has several less important industrial plants. It is a popular and attractive residential city. The town has good primary schools and a high school, Nevin's Memorial Library and the Nevin's Home for the Aged and Incurable. It was founded in 1641 and was a part of Haverhill until 1725, when its separate existence began. In 1920 the population was 15,189.

Methuselah. See AGE.

Metonomy. See FIGURES OF SPEECH.

Metric System, a scientific system of weights and measures. In 1799 an international commission representing ten countries met in Paris to adopt a system of measurements that should be based on some exact unit and be acceptable to all nations. The unit thus settled upon is the ten-millionth part of the distance from the equator to the pole. It is 39.37 inches, a little more than a yard in length. All other units are based on this metre. For distances, the unit of distance is the kilometer, equivalent to 1,000 metres, or over three-fifths of a mile. The unit of area is the are, or 100 square metres. The unit of capacity is the litre, a cube one edge of which is one-tenth of a metre in length. It is about half way between the quart of dry measure and the liquid quart. Unless exactness is required the three may be used indiscriminately.

The unit of weight is the gram. It is the weight of a cube of pure water at its greatest density, whose edge is one-hundredth of a metre. A silver dollar weighs twenty-five grams; a nickel five-cent piece weighs five grams. The kilogram of 1,000 grams is equivalent to two and two-tenths pounds. The metric system is decimal throughout. Multiples of these units, that is to say, larger units, are named by the use of the Greek prefixes *deka, hecto, kilo,* and *myria,* meaning 10, 100, 1000, and 10,000 respectively. The decimal parts of the units are named by using the Latin prefixes, *deci, centi,* and *milli,* meaning $\frac{1}{10}$, $\frac{1}{100}$, $\frac{1}{1000}$ respectively. A dekametre is ten metres; a decimetre is one-tenth of a metre, etc.

Although the names have not been retained in all cases, the metric system has been adopted by Mexico, the countries of South America, and by all European nations except the Russian and the British. In these countries cloth is sold by the metre; railroad distances are stated in kilometres; milk, kerosene, and wines are sold by the litre; potatoes are measured by the hectolitre; land is sold by the hectare; the druggist and the postmaster reckon by grams and the grocer weighs out his sugar, coffee, and tea in kilograms. The system is learned readily. Computations are made with little labor. It is understood by educated people of all nations. It is in general use for scientific measurements.

TABLE OF ENGLISH AND METRIC EQUIVALENTS.

1. Measures of Length.

1 meter	=39.37 in.
1 kilometer	= .6214 mi.
1 yard	= .9144 m.
1 mile	= 1.6093 Km.

2. Measures of Area.

1 square meter	= 1.196 sq. yd.
1 sq. kilometer	= .3861 sq. mi.
1 are	= .0247 A.
1 square yard	= .8361 sq. m.
1 square mile	= 2.59 sq. Km.
1 acre	=40.47 a.

3. Measures of Volume.

1 cubic meter	= 1.308 cu. yd.
1 stere	= .2759 cord.
1 cubic yard	= .7645 cu. m.
1 cord	= 3.624 st.

4. Measures of Capacity.

1 liter	= 1.0567 liq. qt.
1 liter	= .9081 dry qt.
1 hectoliter	= 2.8376 bu.
1 hectoliter	=26.417 gal.
1 liquid qt.	= .9463 l.
1 dry qt.	= 1.101 l.
1 bushel	=35.24 l.
1 liter	=61.022 cu. in.

5. Measures of Weight.

1 gram	=15.432 gr.
1 kilogram	= 2.2046 lb. av.
1 metric ton	= 1.1023 T.
1 grain	= .0648 g.
1 lb. av.	= .4536 Kg.
1 T.	= .9072 T.

See FOOT; YARD; AVOIRDUPOIS; TROY WEIGHT.

Metropolitan Museum of Art, the principal art museum of New York City and of the United States is in Central Park. The institution was founded in 1869 when a committee of 50 art enthusiasts was organized for the purpose of raising $250,000 with which to make a beginning. In 1870 the first officers and trustees were elected, and a charter was secured. In the following year the state legislature appropriated $500,000 for a building in Central Park. A part of the building was completed in 1879; another part in 1902; and further extensions were made in 1904 and 1907.

The museum contains one of the most comprehensive art collections to be seen anywhere in the world. The treasures are classified by departments, and the collections of paintings and sculpture are particularly important. Among the paintings are many rare pieces by the Dutch, Flemish, English, French and American masters. Lorillard, Wolfe and Altman collections are the most valuable of the many collections that the institution has received. The Cesnola collections of antiquities is the richest collection of classic art in the world.

The department of classical art contains splendid examples of the work of the Greeks, Egyptians, Romans and medieval Europeans. In connection with the museum is the most complete art library in the United States.

Metternich, mĕt'er-nik, **Clemens** (1773-1859), an Austrian statesman and diplomatist. He was born as Coblenz, Prussia, and died at Vienna. He was educated at Strasburg. He was the representative of Austria and the master of spirit in the congress that rearranged the map of Europe at the conclusion of the Napoleonic wars in 1814-15. It is a matter of history that the terms of the congress were dictated by Metternich, Talleyrand of France, and Alexander of Russia. The congress merely ratified the decisions of these weighty men.

Metternich was the foremost exponent of the Austrian idea of absolute government. His leading doctrine was: "Sovereigns alone are entitled to guide the destinies of their people, and they are responsible to none but God. . . . Government is no more a subject for debate than religion is." He taught his emperor to express the same thought in another way: "I do not need wise men, but brave and obedient subjects." The patriots of Europe, who longed for a republican, or, at least, a constitutional, form of government, regarded Metternich as the evil spirit of the age—the master of Europe. They said that his rule was worse than that of Napoleon. He formed an alliance between the sovereigns of Austria, Russia, and Prussia. They agreed to assist each other in putting down revolution against any existing government. He controlled Germany clear to the Baltic Sea through the German Confederation. Greece secured her independence from Turkey, greatly to the chagrin of Metternich. London and Paris, centers of liberal ideas, he called the two madhouses of Europe. The feeling against him as an upholder of absolute power became so bitter, even in Austria, that in 1848, the emperor felt obliged to call for his resignation.

He was a man of undoubted ability, ranking in that respect with Bismarck and other great statesmen of modern times. Unfortunately for his memory, his name is linked indissolubly with absolute government. If he could have had his way he would have established a czar in every country of Christendom. Metternich's views appear in the following extract from his political *Confession of Faith*:

> Kings have to calculate the chances of their very existence in the immediate future; passions are let loose and league together to overthrow . . . religion, public morality, laws, customs, rights, and duties. . . .
>
> Union between the monarchs is the basis of the policy which must now be followed to save society from utter ruin. . . .
>
> We are certainly not alone in questioning if society can exist with the liberty of the press, a scourge unknown to the world before the latter half of the seventeenth century, and restrained until the end of the eighteenth, with scarcely any exception but England. . . .
>
> The first principle to be followed by monarchs . . . should be that of maintaining the stability of political institutions against the disorganized excitement which has taken possession of men's minds; . . . and respect for laws actually in force against a desire for their destruction. . .

The first need of society is to be maintained by strong authority, and not to govern itself. . . . The first and greatest concern for the immense majority of every nation is the stability of its laws, . . . never their change.

See TALLEYRAND.

Metz, mĕts, a fortified city of Alsace-Lorraine. It is situated on the River Moselle, about eighty miles northwest of Strasburg. The river here flows through the town in several channels. A series of forts on the surrounding hills makes the city one of the strongest military posts in Europe. It is a city of ancient history. It was originally a Roman camp. It was plundered in the fifth century by the Vandals and later by the Huns. It has changed owners repeatedly. It was a city of the Franks, then became a free city of the German Empire. It was taken by the French in 1552, and was formally ceded to them in 1648. In August of 1870 it was besieged by the Germans. October 28th the French marshal, Bazaine, capitulated, surrendering the city and a force of 180,000 officers and men. The city itself is a place of commercial importance. There are manufactures of woolen, cotton, hosiery, hats, and leather. The pride of the city is the cathedral, a beautiful Gothic edifice dating from the thirteenth century. The masonry is of a particularly light, pointed, graceful style, giving rise to the remark that it is merely a framework for magnificent stained windows. The nave is 370 feet in length and 140 feet in height. The population of Metz in 1919 was 68,445. See ALSACE-LORRAINE; STRASBURG.

Mexico, a republic of North America. It lies between the Gulf of Mexico and the Pacific, and comprises about one-fifth the area of the United States. It borders on the north with California, Arizona, New Mexico, and Texas; on the south with Guatemala and Belize. At its southern termination is a range of lofty volcanoes, including Orizaba and Popocatepetl. The extreme length of the country is 1900 miles. Its width at the Isthmus of Tehuantepec is about 130 miles. The country is for the most part a plateau, leaving but a narrow strip of low land along each coast. This lofty table-land is a prolongation of the Rocky Mountain plateau. Viewed from either coast, the edges of this table-land have the appearance of mountains, rising either precipitously or by terraces; but, as a matter of fact, the borders are a little higher than the central portion. If we except the Rio Grande on the American border, there is no navigable river. The streams are rocky torrents. Evaporation is so rapid that many of them become smaller as they pass through the lowlands to the ocean. Lakes are numerous. The location of Mexico, the capital, is determined by the presence of lakes.

CLIMATE. Mexico lies in the north temperate and in the torrid zone. Three zones of temperature are recognized according to altitude; the torrid climate of the coasts, the temperate climate of the uplands lying from 3,000 to 6,000 feet above the sea, and the cool climate of sections having an altitude of over 8,000 feet. Perpetual snow rests on a few elevated peaks. The temperate region has a climate ranging from 65° to 75° the year through. It has been called a "terrestrial Eden." The tropical coasts are subject to malaria.

MINERALS. The geological basis of the country is granite. Rocks and soils of volcanic origin overlie the granite in many localities. The country is rich in minerals. It has long been noted as one of the chief silver-producing regions of the world. Gold and copper abound. A mile from Durango there is a celebrated mountain, a solid mass of magnetic iron ore. Zinc, tin, platinum, and bismuth are found in abundance, as well as sulphur, asphalt, and petroleum. There are mines of rock salt and alum and excellent quarries of marble and gypsum. Mexico is noted for mineral springs. It is one of the chief commercial sources of mercury. The mountains abound in native gems, opals, emeralds, agates, garnets and topazes. But petroleum production has become the principal mining interest. Mexico's total production increased from 3,932,900 42-gallon barrels in 1908 to 200,000,000 in 1922.

FORESTS. A considerable portion of the country, especially the borders of the plateau and swampy portions of the lowlands, are covered with heavy forests. Those of the lowlands supply mahogany, ebony, and rosewood for cabinet work. The oak and the pine grow in the temperate zone. Mex-

1 Plowing 2 Straw Roofed Dwellings 3 Public Washing Place

MEXICAN SCENES

1. Pyramid of the Sun. 2. Stone Baths. 3. Mural Carvings.

MEXICAN ANTIQUITIES

ico yields enormous quantities of India rubber, and is one of the chief sources of dyewoods. The exports of chicle, the basis of chewing gum, amount to nearly 5,000,000 pounds a year. The makers of patent medicines draw a part of their supplies of sarsaparilla from Mexico. Over sixty medicinal plants and dyewoods are native. Vanilla and cacao are exported in large quantities.

Agriculture. Mexico is a potential source of immense agricultural wealth, but today only a small part of the arable land is worked. The coasts and the hills just back of them, will produce tropical and subtropical fruits, and the great plateau region will yield corn, wheat, cotton, sugar cane, tobacco, beans and almost any other grain or vegetable that will thrive in the temperate zone. One of the principal needs of the country is proper irrigation, for there is an acute scarcity of water.

Since the early Spanish days in Mexico, the raising of stock has been important, and today there are good pasture lands to the extent of 120,500,000 acres. The figures for live stock production to be found in the table at the end of this article indicate that this vast area is not used to the best advantage. And though some effort toward improving the breeds of domestic animals has been made, they still remain inferior.

Manufacture. The manufacturing industries of Mexico are inadequate and to a large extent primitive, but even so they are in a better way now than before the regime of Diaz. There are now establishments for the production of harness and saddlery, cotton cloth, woolens, cigars and cigarettes, pottery, sugar, glass, molasses and some other important articles.

Commerce. The exports of Mexico go largely to the United States. Precious metals and sisal make up over a half of the whole. About one-half of the imports come from the United States. The country is traversed by numerous railways, in all about 10,250 miles, centering chiefly in the capital city.

Population. The *Statesman's Year Book* for 1922 gives the area of Mexico at 767,005 square miles, and the population at 15,501,684, an average of 19.6 per square mile. Nineteen per cent. are white, the rest are natives descended from Indian tribes, or are of mixed blood. Of whites, the Spaniards and Americans are nearly equal in number. There are a few thousand each of French, British, Germans, and Italians, as well as a few Chinese. There are twenty-one cities having a population of over 20,000 each. Mexico, the capital, is the largest city, having a population in 1920 of 1,080,000.

Education, Etc. The prevailing language is the Spanish. The prevailing religion is Roman Catholic. The people of Indian and of mixed blood are mostly illiterate. The government is making an effort to build up a system of schools. There are about 10,000 common schools, forty-two preparatory schools, and sixty-two institutions giving professional or collegiate instruction. The present government made an appropriation of $49,826,716 for education in 1922, and gave aid in this substantial form to a total of 8,388 schools.

Historical. The early inhabitants of Mexico were the Aztecs and other native races. Cortez invaded the country in 1519 and captured the city of Mexico. The country was made a Spanish colony and remained under Spanish rule until 1821, when it achieved its independence under a leader named Iturbide (e-tor-be′dā). The country at that time included what is now the southwestern part of the United States. Texas seceded in 1836. A large slice of territory was lost in the war with the United States, 1846-48. During the American Civil War the Mexican government was subverted by French troops, and Maximilian, an Austrian prince, was placed on the throne. In 1867 the French troops were withdrawn and the present "republic" was reëstablished.

With the characteristics peculiar to the Latin races, there was much unrest and several revolutions until the election of General D. Porfirio Diaz in 1876. His government was in many things, very arbitrary and autocratic—often in entire subversion of the plain provisions of the constitution. However, he justified his course by the claim that it was for the good of the country and that the people

would never prosper except under the rule of an iron hand.

In 1910, a revolution headed by General Francisco Madero forced Diaz to resign. Madero was elected President in October, 1911, but he soon lost the confidence of the leading Mexicans on account of his lenient policy. A revolution was headed by Felix Diaz. Madero was deposed, imprisoned and finally assassinated. General Huerta, commander-in-chief of the army, assumed the title of Provisional President. The United States refused to recognize the Huerta government.

Venustiano Carranza and "Pancho" Villa, styling themselves *Constitutionalists,* headed a counter revolt. Huerta was unable to control the situation and foreign relations became intolerable.

In April, 1914, United States marines who landed at Tampico to purchase supplies were arrested. Admiral Mayo, commander of the fleet in Tampico harbor, ordered Huerta to salute the American Flag as an apology for the insult offered the United States, Huerta refused, and on April 21, American marines entered Vera Cruz, and remained seven months.

The representatives of Argentina, Brazil and Chili in Washington, offered their services as mediators between the governments and their offer was accepted. After investigating the situation they recommended the election of a provisional president by representatives of Huerta and Carranza. But before this could be done, the success of the Constitutionalists forced Huerta to flee from the country. Villa revolted from Carranza, but Carranza finally became the acknowledged leader of Mexico and his government was recognized by the United States, October, 1915.

During 1916, a number of American citizens were slain and property was stolen and destroyed along the international border by Mexican bandits, and in March a raid was made on Columbus, New Mexico. Carranza was either unable or unwilling to make an effort to stop these depredations, and President Wilson ordered a military expedition to enter Mexico in quest of Villa and his band. General Pershing and 6,000 troops penetrated Mexico for 500 miles. Carranza objected to the presence of the American troops, but did not oppose them. The expedition was withdrawn in February, 1917, without accomplishing its purpose. From 50,000 to 100,000 American troops were stationed along the border for months.

Carranza was reelected in March, 1917, and diplomatic relations between Mexico and the United States were resumed. There was a growing conviction that Carranza had mastered the country, when within a few weeks, the whole fabric crumbled. The audacious control of the spring elections by the government in 1920 brought matters to a head. Obregon with the support of the army appeared to have gained the confidence of the people. Various military groups started a concerted march to the capital and Carranza fled on May 5. On May 9 Obregon entered Mexico City with an army of 20,000 troops and quietly assumed command of the situation and the direction of the government. Carranza was offered safe conduct to the coast but refused it. On the way to Vera Cruz his expedition was attacked by revolutionary bandits and fled to the hills where Carranza was presumably slain, although it was reported that he committed suicide.

The Mexican congress appointed de la Huerta, ex-governor of Sonora, President, and he administered the government with marked ability. At the general election, September 5, 1920, General Alvaro Obregon was elected President, with little opposition. He assumed his duties December 1. Under his regime the country gradually returned to normal conditions.

During 1917 Carranza secured the adoption of a new constitution which contained the following paragraph relating to the possession and use of subsoil wealth:

Only Mexicans by birth or naturalization and Mexican companies have the right to acquire ownership in lands, waters and their appurtenances, or to obtain concessions to develop mines, water or mineral fuels in the Republic of Mexico. The nation may grant the same right to foreigners, provided they agree before the Department of Foreign Affairs to be considered Mexicans in respect to such property, and accordingly not to invoke the protection of their governments in respect to same, under penalty, in case of breach, of forfeiture to the nation of property so acquired.

SCENES IN MEXICO.

Upper: View of Monterey, Mexico.

Lower: Chapultepec Castle, City of Mexico. Former site of Montezuma's Palace.

Carranza declared this clause to be retroactive. The United States and other nations protested that this decision would enable the Mexican government to confiscate all the property invested by their respective subjects in Mexico, amounting to many millions of dollars. The question was finally submitted to the Supreme Court of Mexico, which decided that the article was not retroactive.

Difficulties with the United States, relating chiefly to the protection of American capital invested in the petroleum and other industries and the protection of Americans, were finally adjusted—but the United States refused to recognize the Mexican government until Mexico had ratified a treaty in which these agreements were specified. The Obregon government refused to comply with this requirement, claiming that it was contrary to international law, and that such compliance would be humiliating to Mexico. In the summer of 1923 a conference was called to adjust these differences. Full recognition was then granted by the United States, France and Great Britain.

STATISTICS. The following statistics are the latest to be had from trustworthy sources:

Area, square miles	767,198
Forest area, acres	43,933,200
Population (estimated 1912)	15,501,684
Foreign born	116,527
Spanish	29,541
American	28,639
Guatemalan	21,334
Chief Cities:	
Mexico City	1,080,000
Guadalajara	119,468
Puebla	96,121
Monterey	85,000
San Louis Potosi	85,000
Merida	62,447
Leon	57,722
Number of states	31
Members of senate	58
Members of house of representatives	258
National revenue	$135,000,000
Bonded indebtedness	$500,000,000
Cultivated area, acres	30,027,500
Wheat, bushels	14,951,000
Potatoes, bushels	452,000
Henequen, tons	452,000
Cotton, bales (500 lbs.)	188,000
Sugar, tons	140,000
Domestic Animals:	
Horses	929,385
Mules	354,351
Cattle	2,162,984
Asses	287,989
Sheep	1,089,976
Goats	1,987,869
Swine	1,654,089
Petroleum, barrels (42 gals.)	200,000,000
Gold, pounds	46,000
Silver, pounds	3,958,000
Copper, tons	460,000
Lead, tons	121,434
Zinc, tons	14,363
Antimony, tons	1,572
Arsenic, tons	1,198
Manganese, tons	830
Amorphous graphite, tons	2,991
Mercury, tons	770
Imports	$ 80,000,000
Exports	$140,000,000
Miles of railway	10,246
Number of elementary schools	10,500
Pupils enrolled	750,000

Mexico, City of, the capital and chief city of the republic of Mexico. It is situated amid lakes on a marshy table-land, at an elevation of 7,434 feet above the sea. It is surrounded by mountains. It is 263 miles by rail from Vera Cruz and 1,224 from El Paso. The extreme range of temperature is from 35° to 90°. The ordinary temperature ranges from 60° to 80°. Frost is unknown. The hottest months are April and May. The air is always cool at night. The rainy season sets in in May and lasts till September.

Save Buenos Ayres, Mexico is the largest and the most imposing city of Spanish-America. It is a walled city laid out in form of a square, three miles on a side. The streets and alleys cross at right angles. The streets are broad and are well paved with asphalt. The houses are built of stone plastered with stucco, and are two or three stories in height with flat roofs. They are of quaint architecture, and are gayly painted in white, red, yellow, or green. Each surrounds an inside open court called a patio. The houses of the wealthy are faced with colored porcelain tiles arranged in attractive patterns. The windows open on verandas. The patios are adorned with shrubbery and flowers, fountains and statuary. The soil is too marshy for cellars. For fear of earthquakes, the older buildings have no chimneys.

At the center of the city is the plaza or public square, covering fourteen acres,

around which the public buildings are grouped. On the east, occupying the site of Montezuma's old residence is the National Palace, now housing the president's office and some of the departments. At present Congress meets here. The Hall of Ambassadors is hung with paintings of Mexican rulers. George Washington is given a place also. The Mexican bell of independence was rung by Father Hidalgo over his chapel at Dolores to sound the call to arms, September 15, 1810. It has been brought hither and hung over the main doorway. On the anniversary of independence, it is rung at midnight by no less a hand than that of the president of the republic.

On the north side of the plaza stands the cathedral, the greatest church edifice in the New World. In size it is excelled by only ten cathedrals of Europe. It was begun in 1573 and finished in 1657 at a cost of $2,000,000 for masonry alone. It is in the form of a Greek cross 426 feet long and 253 feet wide. The building is of gray stone. There are two great naves, three aisles, twenty side chapels, and a magnificent high altar on marble columns. The interior is Doric; the exterior, Renaissance. The main front is flanked by two bell towers. A tower crowns the center of the edifice. From it a magnificent view of the valley may be had. The air is so clear that the mountains, really thirty or forty miles away, seem but a ten minutes' walk distant. At the foot of one tower is the famous calendar stone, or more probably the sacrificial stone, of the ancient Aztecs.

Other buildings grouped about the plaza or in the immediate vicinity are the national pawn shop, the postoffice, the city hall, the jail, the merchants' exchange, and the national museum of antiquities.

Important buildings situated elsewhere are the mint, the picture gallery—the finest in America,—the Library of St. Augustine, containing 225,000 volumes and many manuscripts, the Iturbide hotel, the school of mines, and the old inquisition building. There are several parks near the city. The largest is the Alameda, covering forty acres. It surrounds the plot wherein the victims of the inquisition, refused burial on holy ground, were interred. Boulevards, fine views, statuary, a profusion of trees and flowers render Mexico the most attractive scenic city in North America. The city is at the lowest point in the valley. A number of surrounding lakes lie at a greater elevation and are kept back by dikes. Canals communicate with the adjoining districts and are the avenues by which the vegetables and dairy and poultry supplies reach the city. A sewer or canal thirty miles long leads to the mountains and passes through them by a rock-hewn tunnel seven miles long, rendering a future inundation of the city impossible.

The city is connected by rail with the Gulf, the Pacific, and west Texas. It is the commercial and financial center of the republic. The population in 1920 was 1,080,000. The mass of the people are Indian or of mixed blood. Business is in the hands of the Spanish and, of late, Americans. The Spaniards monopolize the offices and create the social atmosphere. The city government is modeled on that of the District of Columbia. There is a mounted policeman at every corner. The streets are clean and are well lighted by electricity. There are 1,900 drinking places dealing in wine, beer, and pulque. They are closed at 6 P. M. and at noon on Sunday, when everybody goes to the park concerts or to the bullfights.

The Spanish element takes pride in the history of the city. The first printing press in North America was set up here. A volume printed in Spanish in 1535 is preserved in the public library. A hundred volumes appeared in Mexico before a press was set up in the English-speaking colonies.

Meyer, mī'er, **Johann Georg** (1813-1886), a celebrated Dutch painter. He was born at Bremen. He received his education in art at the Düsseldorf Academy. His first paintings were of Biblical subjects. Later he changed to domestic scenes. He signed his paintings Meyer von Bremen. He painted over a thousand different pictures. He is especially popular with children, as might be inferred from such subjects as *See What Mother Has Brought, Who'll Buy a Rabbit? Birthday Morning, The Little Brother, Toll Paid Here, The Storks Brought It, In Which Hand?* and *The Pet Bird.*

Miami, Fla., the county seat of Dade County, is 366 miles south of Jacksonville, on the Florida East Coast Railway, and on Biscayne Bay at the mouth of the Miami River. This city is a popular winter resort, and is one of the most important shipping points on the south Atlantic Coast. It has boat connections with Baltimore, Jacksonville, Cuba and the Bahama Islands. It is the terminal of the Western Union Cable from South America. In the vicinity are grown valuable crops of lemons, oranges, limes, grapefruit, pineapples and winter vegetables.

The United States government has here a subtropical laboratory, and other features are a two-and-a-half mile bridge across the bay, a beautiful causeway, an alligator farm, a Seminole Indian village, and an aquarium. It has a number of fine hotels, a yacht club and modern schools. In 1920 the population was 29,571.

Mica, mī′ka, a rock-forming mineral well known for its cleavage into thin, elastic laminae, or layers. Mica is transparent and non-combustible. It is used as a substitute for glass and for a variety of purposes. The chief source of American mica is the village of Spruce Pine, North Carolina. The mineral occurs in veins in quartz rock. The mica is quarried with care in blocks. The blocks are split with a knife into thin sheets. The sheets are trimmed with shears into various sizes. The largest size known in the regular trade is eight by ten inches.

For an account of a transparent substance of animal origin with which mica is popularly confounded, see ISINGLASS.

Micah, one of the minor prophets, a contemporary of Isaiah. In the usual arrangement of the minor prophets, Micah ranks sixth, but in the Jewish canon, he is third. Very little is known of his private life. His book is divided into three parts, one addressed to the people, one to the princes, and the last calls upon the mountains to be witnesses of the controversy. See MINOR PROPHETS.

Micawber, Wilkins, mi-kaw′bĕr, a character in Dickens' *David Copperfield.* In the long list of Dickens' characters there is none more celebrated than the impecunious, improvident, but kind-hearted Mr. Micawber. He is fond of making speeches, of writing elaborate letters, and is always in high spirits over some great scheme which is to enrich both himself and friends, or plunged into despair by the collapse of some such bubble. The position and social standing of his wife's family is a never failing source of pride and hope, and, when his debtors become too urgent, he invariably offers to settle by giving his "note of hand." Finally, through the efforts of David, to whom he was invariably kind, Mr. Micawber emigrates to Australia. Emotional Mrs. Micawber, who, through all their troubles, has declared persistently that she "will never desert Mr. Micawber," and their large family accompany him. In their new home something actually "turns up." Micawber pays his debts and becomes prosperous and happy.

> Who does not venerate the chief of that illustrious family, who, being stricken by misfortune, wisely and greatly turned his attention to "coals," the accomplished, the Epicurean, the dirty, the delightful Micawber.—Thackeray.

Michelangelo, mī-kĕl-ăn′jĕ-lō (1475-1564), an Italian sculptor, painter, and architect. He was born at Caprese, Tuscany. He died at Rome. No other intellect has so excelled in three departments of art. From boyhood he displayed ability and intense application. Before he was thirty, a statue of David and a painting called the *Cartoon of Pisa,* representing Pisan soldiers surprised by Florentines while bathing in the Arno, placed him at the head of the artists of Italy. He was invited to Rome to decorate the ceiling of the pope's new chapel, intended to be the finest in Christendom. He had scaffolding erected so that he could walk on a floor under the ceiling. He devised a cardboard helmet somewhat like a miner's cap, to carry his candle at night. He took the keys of the building, shut out every living soul, and for twenty months, extended through a period of four years, he walked and thought, and sketched and corrected and painted the greatest series of pictures the world has ever seen. The entire ceiling is divided into compartments of various shapes and sizes. Each contains a subject. Sev-

eral, as the *Creation of the World,* the *Creation of Man,* and the *Creation of Eve,* are taken from the Old Testament, while figures seeming to hang from the divisions or ribs of the ceiling depict individual patriarchs, prophets, and sibyls.

A few years later he painted the *Last Judgment* for the end of the chapel. It represents the scene at the end of the world described by Matthew, "They shall see the Son of Man coming in the clouds of heaven with power and great glory." Three hundred personages are grouped in this "vast poem." Christ, the dread and impartial judge in the center, unmoved by the tears of his mother and attendant saints, weighs in a just balance the deeds and the secret thoughts of men. The last trumpets are blowing, graves are giving up their dead, while waiting angels convey the souls of the saved to eternal bliss, and the souls of the damned into everlasting punishment. It is a surprise to learn that, in addition to many masterpieces of sculpture and painting, Michelangelo also drew the plans for the dome of St. Peter's, and was counted one of the architects of his day. His chief sculptures are statues of David and Moses executed for the pope..

Michelangelo lived a solitary life, wrapped up in his art, and in his own wild, melancholy thoughts. As Emerson says:

> **The hand that rounded Peter's dome,**
> **And groined the aisles of Christian Rome**
> **Wrought in a sad sincerity.**

Among artists he occupied the place accorded Shakespeare among men of letters. No greater tribute can be paid one mighty intellect than to say he fashioned the *Moses,* he painted the *Last Judgment,* and he raised the dome of St. Peter's.

See St. Peter's; Raphael.

Michelson, Albert Abraham (1852-), a distinguished American physicist, was born at Strelno, Germany, but removed to the United States while still very young. In 1873 he was graduated from the United States Naval Academy; from 1875 to 1879 he was instructor in physics and chemistry at that institution, and in 1878 he was promoted captain. Dr. Michelson went abroad in 1880, studying at Berlin, Heidelberg and Paris. After his return he was made professor of physics at the Case School of Applied Science, Cleveland, Ohio, 1883-89; professor of physics at Clark University, 1889-92; and in the latter year he began a long term as professor and head of the department of physics at the University of Chicago. In 1907 he was awarded the Nobel prize for physics.

Very early in his career Dr. Michelson attracted the attention of the scientific world with his experiments and findings in optics and electricity. Among his greatest contributions to scientific knowledge are his measurements of the velocity of light, which are considered highly accurate. He perfected a system of determining linear distances in terms of wave lengths of light; and to the material side of his subject he contributed new and improved physical apparatus and instruments.

Dr. Michelson received honorary degrees from a number of American and foreign universities and has been honored by many scientific bodies. He has contributed many papers to scientific journals.

Michigan, one of the north central states, is the second largest state east of the Mississippi River, the largest being Georgia. The total area is 57,980 square miles, of which, excluding those parts of the Great Lakes that lie within its borders, 500 square miles are water. The popular name of Michigan is "The Wolverine State," after the wolverine. The state is bounded almost entirely by the waters of lakes Michigan, Huron and Erie, the only land boundaries being Ohio and Indiana on the south, and Wisconsin on the southwestern end of the upper peninsula. The upper and lower peninsulas are formed by the Strait of Mackinac, which connects lakes Michigan and Huron. Michigan has a coast line of about 1,620 miles, the longest in the Union.

Physical Features. The highest point in the state is in the extreme northwest, where the Porcupine Mountains, which reach an elevation of 2,100 feet, run from east to west along Lake Superior. Parallel to this range, but farther south, is the Copper Range, or as it is sometimes called, the Mineral Range. The upper peninsula

is in general, hilly. The iron and copper mines are here, and almost the entire region is covered with timber, though it is not as heavily forested as it once was.

The lower peninsula is, in the northern part, somewhat like the upper peninsula; the highest point is in the east, in the region of Saginaw Bay. But for the remainder the lower peninsula is free from excess of stones and gravel, is pleasantly undulating, and is highly productive as agricultural land. Along almost all of the western edge of the lower peninsula high, white sand dunes rise from Lake Michigan.

There are no large rivers in the state, and few are navigable; but some of them are industrially important because they have falls and rapids that are utilized for power. In the upper peninsula the Ontonagon flows into Lake Superior, and the Menominee and Manistique into Lake Michigan. The rivers of the lower peninsula flow either into Lake Michigan, west, or Lake Huron, east. From north to south, the largest that flow west are the Manistee, Muskegon, Grand, Kalamazoo and St. Joseph; those that flow east are the Thunder Bay, Au Sable, Saginaw and Black. The Raisin and the Huron empty into Lake Erie.

In the lower peninsula there are about 5,000 small, clear lakes surrounded by forests and abounding in fish. These add greatly to Michigan's scenic beauty and attract many visitors. The largest resorts, however, are in the hilly and wooded upper peninsula.

The People. The inhabitants of Michigan numbered 3,668,412 in 1920, making Michigan the seventh state in the Union. Of this number 60,082 were Negroes and 726,635 were foreign born. The total number increased almost a million in the ten years between 1910 and 1920. The urban population in 1920 comprised 61.1 per cent. of the total and the average density was 63.8 to a square mile. But since the principal agricultural region and the largest cities are in the lower peninsula, the density here is much greater than in the upper peninsula. The largest foreign born element in the population comes from Canada. Detroit, with a population of 993,678 in 1920, is the largest city in the state and fourth in the United States. Two Michigan cities have a population exceeding 100,000, and nine exceed 45,000. The capital, Lansing, is fifth in size.

Minerals. Michigan ranks sixth among the states in mineral production. Iron and copper are the leading minerals, with iron leading as to quantity. The upper peninsula is the mining region, especially the extreme northwestern corner, bordering Lake Superior. The famous Calumet and Hecla copper mines are in this district, and the iron mines here are in what is known as the Lake Superior iron region, parts of which are also in Minnesota and Wisconsin. This is the greatest iron producing area in the world. The state ranks second in the production of salt, New York being first. Other minerals found in Michigan, many of them in valuable quantity, are coal, silver, brick and fire clay, asbestos, graphite, sandstone, gypsum and grindstones. The fourteenth census gives $165,970,261 as the total value of Michigan's mineral output for the census year 1919.

Agriculture. The chief source of wealth in Michigan is agriculture. While the most extensive farm lands are in the lower peninsula, yet the southern part of the upper peninsula is productive and under scientific treatment is rapidly improving. Almost all temperate zone crops thrive in the state. Wheat, corn, oats and hay grow abundantly in the south central part, and the soil along the lakes is especially adapted to sugar beet raising. The swampy, reclaimed land around the small inland lakes produces celery, cabbage and onions in abundance. Farther north, potatoes, buckwheat and rye are grown. The most valuable crop is corn. In potato production it ranks third among the states, and is important for the fruits raised — especially the apples and peaches. A unique Michigan industry is the raising of peppermint; what is said to be the largest peppermint farm in the world is in Allegan County, and Michigan produces more of this plant than any other state in the Union.

The stock raising branch of agriculture

is chiefly concerned with dairying, and the state produces butter and cheese of a superior quality. In 1922 there were more sheep than swine in the state, and about as many swine as cattle.

Fisheries. Michigan is first among the Great Lakes states in the quantity and value of its fisheries products, with an annual catch of about 50,000,000 pounds. The principal catch is herring, though whitefish, trout, perch, pike and other species are caught.

Manufacture. Michigan annually becomes of greater consequence as a manufacturing state. It is the greatest producer of automobiles in the world, with sixty-eight major factories in 1922, some of them making the finest cars in the world. The state leads the United States in the manufacture of threshing machines, refrigerators, furniture, engines, drugs and chemicals, and is near the top as a stove manufacturer. Other very important commodities are brass, bronze and copper ware, steel, farm tractors, leather, paper and wood pulp, flour, tobacco products, lumber and printed matter. The annual output of lumber is approximately one billion feet. As a shipbuilder, Michigan ranks seventh. The principal manufacturing centers are Detroit, Grand Rapids, Flint, Saginaw, Kalamazoo, Bay City, Jackson and Lansing.

Transportation. Since Michigan is so surrounded by water that no point inland is more than a hundred miles from one of the Great Lakes, transportation is easy and cheap. The Sault Sainte Marie Ship Canal, between lakes Huron and Superior, carried approximately 75,000,000 tons of freight in 1920. In 1922 there were almost 9,000 miles of steam road, as well as 976 miles of electric railway. The principal railroads are the Chicago & Northwestern, Pere Marquette, Michigan Central, Lake Shore & Michigan Southern, Grand Trunk, Chicago, Milwaukee & St. Paul and the Wabash.

Institutions. A state board of corrections and charities is in charge of the charitable and correctional institutions. The charitable institutions comprise Kalamazoo State Hospital, Pontiac State Hospital, Michigan Home for the Feeble-Minded and Epileptics, a School for the Deaf, School for Poor and Dependent Children and, at Howell, a Sanatorium and Farm Colony for Epileptics.

At Newberry, Kalamazoo, Ionia, Pontiac and Traverse City are Hospitals for the Insane. The state prisons are at Marquette and Jackson, and there is a house of correction at Detroit. The Industrial School for Boys is at Lansing; the Industrial School for Girls at Adrian; and there is a state reformatory at Ionia. The indeterminate sentence, probation system and parole systems are in force in the correctional institutions.

Education. Primary education is free and compulsory for all children between the ages of seven and sixteen. Michigan led the middle states in making provision for the education of backward and feeble-minded children. The schools of each county are under the direction of a county school commissioner, and each school district is looked after by a local board.

The state normal schools number four; they are located at Mount Pleasant, Marquette, Ypsilanti and Kalamazoo. For higher and special education there are Hope College, Detroit College, State Agricultural College, College of Mines, Olivet College, Kalamazoo College, Alma College, Hillsdale College, Adrian College, Albion College and the University of Michigan.

The latter is one of the largest and most important state universities in the United States. It was established at Ann Arbor in 1837 and opened in 1841, and has been coeducational since 1870. The institution comprises colleges of literature, arts and sciences, law, medicine, architecture, engineering, chemistry and dental surgery, and it has a graduate school. Recently, courses in marine engineering, highway and construction engineering, wireless telegraphy and forestry have been established. There are two general hospitals and a state psychopathic hospital operated in connection with the university. There is a splendid library containing 457,800 volumes. In 1922 the faculty numbered 753 and the student body 11,800.

GOVERNMENT. The original Michigan constitution was adopted in 1837; a second one in 1850; and the present constitution in 1908. Authority is vested in a Senate of 32 members and a House of Representatives numbering 100. The franchise is extended to all United States citizens above twenty-one years who have resided in the state for six months preceding the election. Amendments to the constitution may be proposed in either house, and also by petition of not less than ten per cent. of the qualified voters.

The governor, lieutenant-governor, secretary of state, attorney-general, auditor-general and superintendent of public instruction are elected for two years, and the state fire marshal is appointed by the governor. The judges of the state supreme court are elected for eight years.

Under the present constitution, towns and cities may adopt the commission form of government. The constitution is very modern and liberal, and makes many enlightened provisions for the regulation of the hours and conditions of work for women and children.

HISTORY. Michigan was visited early in the seventeenth century by fur traders and Jesuit missionaries, but the first settlement was made not until 1668. This was at Sault Sainte Marie, where Father Marquette established a mission post. Cadillac founded Detroit in 1701, and numerous other villages soon sprang up. The territory passed from the French to the English after the French and Indian War, and trouble with the Indians, led chiefly by Pontiac, ensued, but it was secured by the United States after the close of the Revolutionary War. Michigan was then a part of the Northwest Territory for a time; it later became part, first, of the territory of Ohio, and later of Indiana; but in 1805 it was made a separate territory. In 1837 it was admitted to the Union as the twenty-sixth state. The capital, established first at Detroit, was moved to Lansing in 1847. A period of steady growth began in about 1850, and has continued to the present time. Michigan was strongly anti-slavery in the Civil War, and contributed money, arms and almost 100,000 men to the Union cause. Over 175,000 men entered the military and naval service during the World War.

STATISTICS. The following statistics are the latest obtainable from trustworthy sources:

Land area, square miles	57,480
Water area, square miles	500
Forest area, acres	19,000,000
Population (1920)	3,668,412
White	3,608,330
Negro	60,082
Asiatic	1,089
Indian	5,614
Foreign born	726,635
Chief cities:	
Detroit	993,678
Grand Rapids	137,634
Flint	91,599
Saginaw	65,648
Lansing	57,327
Kalamazoo	48,858
Jackson	48,374
Bay City	47,554
Highland Park	46,499
Muskegon	36,570
Battle Creek	36,164
Number of counties	83
Members of state senate	32
Members of house of representatives	100
Salary of governor	$5,000
Representatives in Congress	15
Assessed valuation of property	$5,319,702,886
Bonded indebtedness	$113,500,000
Farm area, acres	19,340,204
Improved land, acres	12,752,083
Corn, bushels	66,417,000
Oats, bushels	28,101,000
Potatoes, bushels	27,200,000
Beans, bushels	2,972,000
Sugar beets, tons	1,106,000
Hay, tons	2,928,000
Onions, bushels	693,000
Peas, tons	5,085
Wool, pounds	6,554,000
Domestic animals:	
Horses	614,000
Milk cows	856,000
Other cattle	727,000
Sheep	2,135,000
Swine	1,435,000
Manufacturing establishments	8,305
Capital invested	$2,340,954,312
Operatives	471,242
Raw material used	$1,919,243,243
Output of manufactures	$3,466,188,483
Coal, tons	1,489,765
Iron ore, long tons	12,911,727
Copper, pounds	153,482,952
Pig iron, tons	1,893,611
Salt, value	$10,698,674
Cement, value	$838,300
Clay products, value	$11,295

Miles of railway	8,927
Teachers in public schools	24,938
Pupils enrolled	729,053

See CADILLAC; ANTOINE; MARQUETTE; DETROIT; SAULT SAINTE MARIE; PONTIAC; NORTHWEST TERRITORY.

Michigan, one of the Great Lakes. The name is Algonquin, signifying big water. Four states lie on its borders. Two-thirds of the coast line belongs to Michigan. The largest arm is Green Bay. The largest tributary is the Fox. The extreme length of the lake is 340 miles; greatest width, eighty-five miles. The surface is 578 feet above sea level. The greatest depth is about 1,000 feet. Area, 22,000 square miles. The lake is subject to violent storms and to tides at Chicago of about one and three-fourths inches. Lake Michigan formerly discharged its waters by way of the Chicago and Illinois into the Mississippi, but it now communicates with Lake Huron by way of Mackinac Strait. The opening of the Chicago River canal has set up a flow through the old channel. See CHICAGO.

Michigan City, Indiana, an industrial city and rapidly developing resort city, is 56 miles by rail east of Chicago, on Lake Michigan. It is the oldest lake port in Indiana. The distance across the lake from Chicago to Michigan City is only thirty-eight miles. Transportation is afforded by numerous lines of lake steamers and by the Lake Erie & Western (Nickel Plate), Pere Marquette, Michigan Central and Chicago, Indianapolis & Louisville railroads and interurban lines.

Michigan City was founded in 1833, and because of its location, its growth was rapid. Lumber, salt and iron ore are the chief articles of commerce, and there are manufactories of steel products, candies, curled hair, hosiery and knit goods, lumber, furniture and railroad cars. The city has good schools, a United States coast guard station, several parks, a library and the Northern Indiana State Prison. In 1922 the population was 22,000, and it is steadily increasing.

Microscope, an optical instrument by means of which minute objects are magnified. A double purpose is thus served. Objects too small to be seen by the naked eye become visible. Objects are also enlarged, so that their minute structure may be examined. The invention of the microscope is credited to the Janssen brothers of Holland, somewhere between 1590 and 1609. The supporters of Galileo, to whom the honor of inventing the telescope belongs, claim also that he must have invented the microscope.

Microscopes are of two kinds, simple and compound. The former is merely a double convex lens. When the microscope is held at the right distance from an object, the rays of light coming from the object are caused to converge. They enter the eye as though they came from a larger, more remote object. This enlarged imaginary object is called an image.

In a compound microscope a second lens or set of lenses creates a magnified image of the first image. A simple microscope magnifies from five to twenty diameters, giving from twenty-five to 400 areas. A compound microscope of exceptional power gives as high as 5,000 diameters, or 25,000,000 areas. A pocket lens or magnifying glass may be purchased for twenty-five cents and upward. A serviceable compound microscope suitable for a laboratory costs from fifteen to several thousand dollars.

For a century or two, the microscope was a mere plaything. It is now a necessity. It is an easy matter to adulterate starch, sugar, flour, ground coffee, many drugs, dry paint, and other articles, so as to pass the naked eye; but if a pinch be placed beneath the microscope an expert can identify the particles of different substances with ease. The great advance that has been made in the cure and prevention of typhoid, malaria, yellow fever, scarlet fever, diphtheria, and consumption has been rendered possible by the use of the microscope in studying the bacterial germs or microbes now known to be the causes of these diseases. By placing a scraping of skin, a drop of blood, or other bit of matter under the microscope, the physician is able frequently to determine the nature of the disease with which the patient is afflicted. The microscope enables the expert also to determine whether meat is infested with trichinae. The lens is also

used in determining the fineness of cloth. When placed behind a fine wire grating and magnified, it is easy to count the number of threads in a given space

See LENS; TELESCOPE.

Midas, mī'das, in Greek mythology, a king of Phrygia. He was the son of Gordius, the same who tied the Gordian Knot, and of Cybele. Dionysus, the god, being under obligations, offered to grant Midas any request he might ask. Midas in his greed requested that whatever he touched might turn to gold. The request was granted. Midas found, however, that, when he undertook to drink, a cataract of gold poured from a golden cup. If he undertook to eat he found a lump of gold in his mouth. Even his clothing turned into golden armor. In his distress he begged the god to take back his gift. Dionysus told him to bathe in the river Pactolus. This he did. The sands of the river were celebrated ever afterwards for shining gold, and became the source of Croesus' wealth. Midas was called upon to decide whether the pipes of Pan or Apollo were the sweetest. He was unwise enough to decide the contest in favor of Pan; whereupon Apollo, as a punishment, gave Midas a pair of ass's ears. These he concealed from even his wife. His barber discovered the fact, and, being unable to keep a secret entirely to himself, ran and whispered it into a hole in the ground. A clump of reeds sprang up and whispered the secret abroad to the winds. The winds told it everywhere. Nathaniel Hawthorne has related the story of Midas in his *Wonder Book* under the title of *The Golden Touch.*

Middle Ages, a somewhat old-fashioned term applied to the period of history extending from the "fall" of the Roman Empire to the taking of Constantinople by the Turks in 1453. It embraces from ten to eleven centuries. The early period is known also as the Dark Ages, the last part as the Renaissance. Important topics of the period are Islam, Feudalism and Chivalry, the Papacy, Monasticism, the Crusades, the Turks, Free Cities, etc. Recent writers distribute medieval history. They divide the world's history into ancient and modern. Ancient history is held to close with the death of Charlemagne.

Middlemarch. See CROSS, MRS. MARY ANN EVANS.

Middleton, Sir Frederick Dobson (1825-1898), a British soldier, was born in Belfast, Ireland. After graduation from the Royal Military College at Sandhurst in 1842, he saw active service in New South Wales, New Zealand, Burma and India. For valorous service in the Indian Mutiny of 1857-58, Sir Frederick was awarded the Victoria Cross. He was in Canada with his regiment from 1860 to 1870, returning to England in the latter year. Returning to Canada in 1884 as commander-in-chief of the Canadian militia, Sir Frederick energetically suppressed the Saskatchewan, or Riel, Rebellion of 1885. For this service he was granted $20,000 by the Canadian government, and was knighted by Queen Victoria. Returning to England in 1890, Sir Frederick was appointed keeper of the crown jewels in 1896.

Middletown, Conn., a manufacturing city and the county seat of Middlesex County, is 16 miles south of Hartford, on the Connecticut River and on the New York, New Haven & Hartford Railroad. It is connected with Portland, where are valuable brownstone quarries, by a long drawbridge across the Connecticut River. Middletown manufactures include pumps, woolen blankets, harness trimmings, marine hardware, locks, bone goods, hammocks, rubber goods and silver-plated ware.

Founded in 1650, it is one of the oldest cities in the state. It contains Wesleyan University, Berkeley Divinity School, the State Hospital for the Insane and the State Industrial School for Girls. In 1920 the population was 13,638.

Middletown, N. Y., a city in Orange County, is near the Wallkill River and on the New York, Ontario & Western, Middletown & Unionville and Erie railroads, 67 miles northwest of New York City. One of the railroads maintains repair shops here, and there are factories producing automobile tires, wrapping machines, shirts, straw hats, saws and files, condensed milk, cut glass and other commodities.

Middletown is the seat of the State Homeopathic Hospital for the Insane, and has a Federal building, a state armory, a

library and good public schools. The population was 18,420 in 1920.

Middletown, Ohio, is situated on the Miami River and on the Miami & Erie Canal, 34 miles north of Cincinnati and is served by several railroads. It is in the rich Miami Valley, and is the market for much wheat, tobacco and corn grown here. The chief products of the city's factories are steel, motorcycles, agricultural implements, paper, gas engines, tobacco products and paper-making machinery.

Middletown was settled in 1794. It contains a Federal building and a Carnegie library, and has a modern public school system. The water works are the property of the city. The population in 1920 was 23,594.

Midgard, mĭd'gärd, in Scandinavian mythology, the middle world or dwelling place of the human race. It was connected with Asgard, the dwelling of the gods, by the rainbow bridge. Midgard was formed from the eyebrows of the giant Ymir, the first created being. The Midgardsorm or Midgard serpent was an immense serpent—one of the offspring of Loki. It was cast by Odin into the sea which encircles the earth and was believed to lie coiled in the waters about the earth. See MYTHOLOGY.

Midge, mĭj, a small insect allied to the mosquito and the fly. There are many species, in fact several families. Most of them are harmless. They deposit their eggs in the bark of decaying branches, under fallen leaves, in lakes, or even in the sap flowing from wounded trees,—wherever moisture can be found. One of the most annoying midges is the Indian "no-see-'em." This midge is so small as hardly to be seen, but its bite is more painful than that of the mosquito. It is so diminutive that nothing short of cheesecloth will keep it out. When resting, the midge usually lifts the front pair of legs. The mosquito raises the hind legs.

Midsummer Night's Dream, a comedy by Shakespeare acted in 1595 and printed in 1600. The date of its composition is uncertain, although it is probable that it was among Shakespeare's first productions.

Midway Islands, a group of islands in the North Pacific midway between America and Asia. The islands have come into notice as an intermediate station of the American Pacific cable which extends from San Francisco to Honolulu and the Philippines. The group consists of a low, circular coral atoll inclosing a bay some five miles in diameter. Within this shelter there are four islets, the largest of which is above a mile in length and rises to a height of forty-three feet above the sea. In 1887-9 a shipwrecked crew lived here for fourteen months. The present inhabitants are cable employes. Good fresh water may be had by sinking wells. There is an abundance of food fishes, turtles, and crabs. The islands are covered with a coarse grass, and are the nesting places of countless terns. The United States Navy Department has issued orders forbidding the use of firearms and the molestation of birds.

Mignonette, mĭn-yŭn-ĕt', a genus of half a hundred fragrant plants, chiefly herbs of the Mediterranean region. Florists have made a more showy flower out of the common garden plant, but at the expense of fragrance. It is claimed that mignonette grown in neglected, gravelly, waste places has a more delicate fragrance than a hothouse plant. The name is French for "little darling." See PERFUM-

Migration of Birds, the habit of birds of traveling northward in the spring and southward in the fall. Since the range of many migrating birds is quite limited, since species which are permanent residents in some localities are migratory in others, and since most so-called permanent residents change their locality more or less during the winter weather, the conclusion has been reached by students of bird life that the migratory habit has developed in sedentary birds. Since tiny birds like the sparrow, the kinglet, and the cross-bill, no better protected than the migrants, endure cold and snow safely, we may conclude that birds are not driven to the south by winter weather alone, but go in search of their natural food, the supply having been cut off by the cold and the snow. Birds as a usual thing go no farther south than is necessary to find the particular kind of food they require.

Up to the close of that period in the

history of Mother Earth which geologists call the Tertiary epoch, it is believed that the climate almost to the north pole was subtropical, and so nearly equable that no necessity for migration existed. As the northern regions grew colder and as this cold advanced southward during the Ice Age, bird life must have been driven toward the equator. It is easy to believe that those species whose food is more varied and thus easier to find under varied conditions, and those better able to endure the cold would extend their range gradually by moving southward in winter and returning north as the cold receded in the spring. To quote Prof. J. A. Allen, "what was at first a forced migration would become habitual, and, through the heredity of habit, give use to the wonderful faculty we term the instinct of migration."

The routes by which birds migrate are quite definite, sometimes covering distances of thousands of miles. The marvelous sense of direction—someone calls it an "inherited talent for geography"—which enables the tiny creatures to find their way to and from the spot where they were born is the result of practice, as Leonard Stefneger tells us in his introduction to Kingsley's *Natural History, Birds,* "though not only the practice of the individual, but the practice of the species, the accumulated practice of thousands of generations."

In spite of this seemingly simple explanation of bird migration, there are many instances where the habits of individual species are most baffling. The bobolink, a bird known everywhere in the United States, except on the Pacific coast, furnishes some of these difficult questions. In summer this jolly little songster lives in the north, finding his mate and nesting even as far as the banks of the Saskatchewan in Canada. In August he starts south. Changing his suit of feathers, his character, and even his name, he becomes the low-voiced, dull-colored, reed-bird who grows fat on the wild rice of the Delaware and Chesapeake Bay region. He is looked upon as a delicacy, and, according to Hornaday, makes a little more than one mouthful but "by no means enough for two," for some epicure who could not eat him, certainly, had he ever seen him in his wedding suit singing his gay song. The bobolinks that escape the hunter go still farther south in the fall, feeding in the rice fields, where they are regarded as the enemy of man. They winter in South America and the West Indies. Another bird whose ways are past finding out is the golden plover, which is seen in the United States only while journeying northward in spring, and sometimes on the New England coast for a transient visit in the fall, when his color blends so well with the golden grain, and the yellow tints of autumn foliage that he is all but invisible.

Summering on the Arctic coast of North America, these birds, as soon as their families are grown, fly eastward to Labrador where they remain a few weeks, growing fat on the native fruits. They next make a short trip to Nova Scotia, and from there take up their journey to winter quarters, flying 2,400 miles straight across the ocean—without rest if the weather is good,—to eastern South America, whence they continue their journey to Argentina. After six months in this tropical climate they take their spring journey northward, but by a wholly different route, flying over land nearly all the way.

The black-poll warblers and the cliff swallows winter in the same region of eastern South America. In the spring the black-poll flies almost directly northwest to Alaska, while the cliff swallow takes a more westerly course, keeping above land all the way, through Central America and Mexico, then turns eastward, crossing the black-poll's path and flies straight to its summer home in Nova Scotia.

Why does the robin, who usually winters in the southern states and in Mexico, and nests from Virginia to Alaska, choose occasionally to pass the winter in some northern locality? Why do redheads and flickers stay all winter in a certain locality one year and go south the next year, even though the winter be milder? Why do the males of many species migrate before the females? Why do the young of some species precede their parents in the southward journey? Why do the black-poll warblers travel at night? And why do the humming birds and tanagers, evidently of southern origin, come north to build

their nests and rear their young? All these and many other questions are waiting to be answered.

But in the meantime these migratory habits add to the pleasure of the bird lover. From the first flock of geese who cry "honk! honk!" above his head in the spring to the last red-winged blackbird who bids him farewell in the fall, the travels of his feathered friends are as interesting as their housekeeping, and he knows no delight greater than to be abroad at sunrise on that morning in May when the warblers first appear, and in the general excitement of joyful arrival seem utterly to forget his presence.

Mikado. See JAPAN.

Milan, a city of Italy. It is the second city of the kingdom, ranking next to Naples in size. It is situated on a branch of the Po, in the center of Lombardy, and is the commercial metropolis of that region. The city is surrounded by a wall seven miles in circumference. A fine drive follows the outside of the wall. The city within is a maze of narrow, crooked streets, relieved only by a few open squares. The chief building is Milan Cathedral. It stands in one of these open places. It is built of brick and is cased in white marble. It is an immense edifice of great beauty. It is noted for the vast number of spires. It was begun in 1387. It was finished by order of Napoleon in 1805. Among European cathedrals it is exceeded in size only by St. Peter's of Rome and the Cathedral of Seville. It is 477 feet in length and 183 feet in width. The main tower is 360 feet high. The general style is Gothic. The interior is particularly impressive. The vaulted roof is carried by fifty-two columns. The windows contain richly stained glass. There are over 2,000 statues. The city possesses also a beautiful gallery of high rank containing work by Leonardo da Vinci, Raphael, and other famous artists.

Seen from the roof of the cathedral, the plains of Lombardy present an unending succession of cultivated fields laid off in squares by rows of Lombardy poplars or of mulberry trees. The region is one of the richest agricultural districts in the world. Water is brought from the Alps and the Pyrenees in irrigating ditches, enabling the peasants to raise a never-ending succession of crops. The meadows are cut or grazed four times a year. Rice, Indian corn, and wheat are the chief field crops. The district is noted also for cheese and milk.

Milan is the industrial capital of Italy. The principal industry of the city and immediate vicinity is the production and weaving of silk. It is the second city in the world in the manufacture of silks. It is pushing Lyons, France, hard for first place. Locomotives, electrical apparatus, carpets, and earthenware are manufactured. Milan is noted also for lace, jewelry, and millinery. In fact, the word millinery is said to be derived from Milan, a milliner or Milaner being one who sold feminine articles, ribbons, and the like, from Milan. Population 663,059.

Milan Decree. See CONTINENTAL SYSTEM.

Mildew. See FUNGI.

Mile, a measure of distance. Mile is from the Latin *mille,* a thousand, and means literally a thousand steps or paces. A legal mile is 5,280 feet in length. A square mile contains 640 acres. The ancient Scottish mile equaled 1,976 yards or 1.123 English miles. The Irish mile equaled 2,240 yards or 1.273 English miles. The Welsh mile was nearly four English miles in length. The term has been used variously in the countries of continental Europe. The greatest mile is that of Saxony which equals 9,062 metres; the least being that of Greece, a mountainous country, which equals 1,292 metres. The geographical or nautical mile or knot defined by the United States Coast Survey is the one-sixtieth part of the length of the degree on a great circle, or 6,080.27 feet.

Miles, Nelson Appleton (1839-1925), American soldier, was born at Westminster, Massachusetts. In youth he was a clerk in a Boston store. At the outbreak of the Civil War he entered the army as a lieutenant in the 22d Massachusetts regiment. He was with McClellan in the Peninsular Campaign. He was with the Army of the Potomac constantly until the close of the war. He came out with the rank of major-general of volunteers. At the close of the war he was made a colonel of infantry in the regular army. He was pro-

moted repeatedly. In 1895 he was placed in chief command, and in 1900 he was given the rank of lieutenant-general. In 1903 he was retired from active service. Miles' chief reputation is that of an Indian fighter. From 1874 to 1886 he was engaged in chastising the Cheyennes, Comanches, Sioux, Nez Perces, and Apaches of the Great Plains country extending from Montana to Arizona. As a daring rider and strategist he was matched against Chief Joseph, Geronimo, and Sitting Bull. For his services he was thanked formally by the legislatures of Arizona, New Mexico, Montana, and Kansas. He led the American troops in the Porto Rican campaign of 1898. During the last year or two of his service General Miles fell somewhat under a cloud. He discussed Admiral Dewey and other public men as well as public measures, unbecomingly, it was thought. Military etiquette requires an officer to maintain silence with respect both to his superiors and his inferiors. See ARMY; COMANCHE; CUSTER.

Military Schools, institutions in which soldiers or young men are educated and trained for the profession of arms. In the United States, military education is prescribed in general orders from the War Department. The Military Academy at West Point for the education of cadets is at the foundation of the whole system. A description of the institution will be found under the heading WEST POINT. Other institutions are post schools for enlisted men, garrison schools for the instruction of officers, special service schools, the Army War School at Washington, and such other schools as are established by law, or on orders from the Department.

Post schools for enlisted men are established at every army post. Instruction in the common English branches and in the history of the United States is given by competent teachers, detailed from the enlisted men, one teacher for every fifteen men. The course of study in the garrison schools for officers is prescribed by the general staff. It covers a period of three years in the regular, and three years in the post-graduate department. It embraces all subjects pertaining to the life of officers, from the ordinary routine to the most technical duties of the profession. Special service schools include the Coast Artillery School at Fort Monroe, Virginia; the Engineer School of Application at Washington Barracks, D. C.; the Mounted Service School at Fort Riley, Kansas; the Army Service School at Fort Leavenworth; the Army Medical School at Washington, and the School of Submarine Defense at Fort Totten, New York.

The Army War College at Washington is not for academical instruction but is designed to make practical application of military knowledge already acquired. The students are chosen from the captains and majors of the army by the War Department and to be so chosen is regarded as an honorable recognition of one's attainments.

Militia, mĭ-lĭsh'-a. The militia of the United States, under the present law, is made up of all able-bodied male citizens, either native or naturalized, between the ages of eighteen and forty-five years. There are certain classes of citizens exempted by law from militia duty, including the President and the various government officials and those persons in the naval or military services of the United States.

The militia of the United States is divided into three general classes, viz., the national guard, the naval militia and the unorganized militia. The military and naval forces exempted by law from militia duty include the regular army, the organized reserves, the regular army officers' reserve corps, the navy personnel, the naval reserve and the U. S. marine corps. The national guard also becomes a part of the army of the United States when called by the President or drafted into federal service and ceases to be militia.

Under the Constitution the individual states are prohibited from maintaining troops other than those maintained by the Federal government. Strictly speaking, therefore, there is no such thing as "state troops." For police purposes, however, a number of states maintain organizations but these are not "troops" in the military sense of the term. Examples of these organizations are the Pennsylvania Mounted Police, the Texas Rangers, etc.

The national guard, formerly termed the organized militia, was given its first definite Federal footing under a law passed in 1903. The National Defense Act of June 3, 1916, provided for the expansion of the national guard and for an increased Federal obligation toward that force. The national guard is a force with a dual status and its members take an oath of allegiance to both the state and the nation. When not in Federal service under a call or draft the national guard rests under the orders of the governor of the state where organized. The governor ordinarily speaks through the state adjutant general. At his discretion the governor may call out the national guard under his jurisdiction to act in any emergency, such as riots, strikes, floods, and other disasters beyond the control of local authorities.

The United States, under a law of June 4, 1920, amending the National Defense Act of 1916, has been divided into nine corps areas. To each area there has been allotted two national guard infantry divisions and over the country at large there have been allotted four national guard cavalry divisions together with quotas of corps and army troops that are not divisional units but function directly under the corps and army commanders. There are also national guard units authorized for Porto Rico, the Hawaiian Territory and Alaska, the latter having taken no steps to organize this force. The composition of the different corps areas is as follows:

	1st Corps Area
Connecticut	New Hampshire
Maine	Rhode Island
Massachusetts	Vermont
	2d Corps Area
Delaware	
New Jersey	New York
	3d Corps Area
Maryland	Virginia
Pennsylvania	District of Columbia
	4th Corps Area
Alabama	Mississippi
Florida	North Carolina
Georgia	South Carolina
Louisiana	Tennessee
	5th Corps Area
Indiana	Ohio
Kentucky	West Virginia
	6th Corps Area
Michigan	
Illinois	Wisconsin
	7th Corps Area
Arkansas	Iowa
Kansas	Minnesota
Missouri	Nebraska
North Dakota	South Dakota
	8th Corps Area
Arizona	
Colorado	Oklahoma
New Mexico	Texas
	9th Corps Area
California	Oregon
Idaho	Utah
Montana	Washington
Nevada	Wyoming

The states of Massachusetts, New York, Pennsylvania, Ohio, Illinois and Texas have been allotted complete national guard infantry divisions, and the remaining infantry divisions and the four cavalry divisions are distributed over two or more states.

On April 1, 1923, the national guard showed an enrollment of 159,286 including 9,219 officers. The strengths of the various infantry and cavalry divisions were as follows on that date:

28th Inf. Div.	8069	44th Inf. Div.	5745
27th Inf. Div.	7993	30th Inf. Div.	5588
37th Inf. Div.	7497	45th Inf. Div.	5187
38th Inf. Div.	7290	33d Inf. Div.	4906
32d Inf. Div.	6979	43d Inf. Div.	4785
26th Inf. Div.	6579	41st Inf. Div.	4696
36th Inf. Div.	6564	40th Inf. Div.	3206
35th Inf. Div.	6461	21st Cav. Div.	3394
39th Inf. Div.	6360	22d Cav. Div.	3275
34th Inf. Div.	6024	23d Cav. Div.	3394
29th Inf. Div.	5919	24th Cav. Div.	1993

See ARMY.

Milk, a whitish fluid secreted by mammals for the nourishment of the young. The two milk glands of the elephant are situated between the fore legs; those of the mare between the hind legs; those of the sow, the cat, and the mouse are distributed in two rows along the entire abdomen. Most domestic animals have two glands or teats. The cow has four.

The total production of milk in the United States in 1921 was 98,862,276,000 lbs. On the basis of production per capita of population this amounted to 107 gallons for every man, woman and child in the country.

Milch cows on farms increased by 341,000 head during 1921, there being 24,028,000 head on January 1, 1922; in addition, the number of milch cows not on farms was estimated at 1,250,000. The average yield

of all the cows in the country in 1921 was 3,945 pounds of milk, or about 10.75 lbs. a day throughout the year.

Condensed and evaporated milk production in 1921 amounted to 1,464,163,000 lbs. Milk powder production was 4,243,000 lbs., showing a great decline from 1920, when it amounted to 10,334,000 lbs.

There was a large increase in 1921 in the amount of whole milk used for household purposes, approximating five billion pounds. The figures for the average consumption of milk and cream in cities, obtained by the United States Department of Agriculture from reports from 300 cities with a total population of 33,676,563, or nearly one-third of the population of the United States, showed the average quantity of whole milk consumed per person in the cities to be about 0.668 or a little more than two-thirds of a pint daily; and in addition, the consumption of cream accounted for the utilization of 0.167 of a pint of milk, making a daily total equivalent to 0.835 of a pint of whole milk.

Combining the rural and urban consumption, the average per capita consumption of whole milk as milk and cream for household purposes was 1.08 pints daily in 1921. This is equal to 49 gallons of milk annually, which is the largest annual per capita consumption on record in this country.

Wisconsin is the greatest milk-producing state in the Union, its production in 1921 having been 858,258,251 lbs. New York came next, with 756,045,942 lbs., followed by Minnesota, 475,506,689 lbs.; Pennsylvania, 421,631,355 lbs.; Ohio, 396,317,787 lbs.; Michigan, 382,822,631 lbs.; Illinois, 370,486,981 lbs.; and Iowa, 361,426,362 lbs. Indiana, Missouri, Kansas and Texas followed in the order named, each producing over 200,000,000 lbs. of milk in the year. Then came Nebraska, Kentucky, Washington, North Dakota, Tennessee, South Dakota, Vermont, Virginia and Georgia, all of which produced more than 100,000,000 lbs. of milk. Milk averages about 8.60 lbs. to the gallon.

Milk is particularly adapted for human food because it contains the four essential nutrients, protein, fat, carbohydrates, and mineral matter, in better proportions than almost any other food material. While it is sometimes said to be the perfect food, this applies especially to the young of the human species, and it does not constitute of itself a perfect food for adults. One reason for this is that it contains so large a proportion of water that from four to five quarts of milk would have to be consumed each day to furnish the nutrients necessary for an adult person. But its food value, when taken in connection with other food materials, is very great, and it is of special value as an easily digested food for invalids. There are about four ounces of nutritive material in a quart of milk, which is equal to three-quarters of a pound of beef or six ounces of bread, but these quantities have varying food values. Milk and cream furnish about 20 per cent. of the dietary of the average American family.

Regulation of the milk supply of American towns and cities has been the subject of many laws and ordinances, and is now general throughout the country. Milk inspection has been extended in many places to include inspection of dairy herds, barns and stables, as it has been realized that the chief sources of danger to the public health through the presence of bacteria in milk or the cow herself, her milker, the atmosphere of the stables, and the utensils used in the dairy. Adulteration of milk, by the addition of water and in other ways, is now not so common as formerly, and standards for milk have been adopted in many states, the average standard providing about 12½ per cent of total solids and at least 3 per cent of fat.

Condensed milk, either sweetened or unsweetened, is sold at retail in sealed cans for household use, and in bulk for use by bakers, ice-cream manufacturers, and confectioners. The process by which milk is condensed was invented by an American and patented in 1856. In 1920 there were 401 condensed-milk factories in the United States, employing 13,675 wage-earners, with an annual product valued at $340,000,000.

See Food; Butter; Cheese; Cow.

Milking Machine, a substitute for the human hand for withdrawing milk from the cow. A great deal of experimentation has naturally been done in this field on

account of the labor involved in the ordinary manual method, but with little success till recently. The application of the vacuum principle to the problem seems to be the solution. A fairly successful form consists of four rubber caps for the udder which are joined by short tubes to a hose leading to a receiver for the milk. Suction is produced by a hand pump, gasoline engine, or electric motor. The degree of exhaust is regulated by the attendant and registered on a gage. From the same engine or motor, tubes may extend to a number of cows and all be milked at once with but one attendant. One of the great draw-backs to extensive dairying has always been the number of people required to do the milking. A milking machine that will successfully do the work of several persons is a boon to the industry, and many machines are now in practical use.

Milk Snake or **House Snake,** a common snake in North America east of the Rocky Mountains. It received its first name from a prevalent frequenting of dairies or places where milk is kept, but although many assert that it actually drinks the milk, there is no authentic proof of this. It feeds on rats, for which it is at all times searching, and for this reason should be very kindly received by farmers.

The milk snake is a harmless reptile, far more harmless than the prey that it destroys. In appearance it is yellowish grey on top, spotted on the back, and brown beneath. It sometimes grows to a length of four feet. It is very quick in its movements, climbs expertly, and for that reason very often frightens people who believe that it is poisonous. It is very abundant in the middle states and Ontario, but is seldom seen west of the Rocky Mountains.

Milkweed, a common plant with milky juice. We have a large number of milkweeds. The entire family includes over 1,000 species, most of them found in tropical climates. Most observing young people have noticed the fleshy flowers with a hooded crown and curious horns. The stickiness of the milk is due to rubber of which it contains considerable quantities. The bark of some kinds yields a valuable fiber. A mountain tribe of India uses these fibers to make elastic bowstrings. Another tribe makes the ropes and bands used in wells of this material, because it does not rot in water. From the roots of the red milkweed, over which orange-colored butterflies hover, herb doctors drew a valuable remedy for pleurisy. Several tropical milkweeds are cultivated in hothouses on account of their curious flowers. The silky down of the milkweed pod suggests the cotton plant.

By far the loveliest and most brilliant form of milkweed to be found in America is the butterfly weed, although it is not nearly so common as some of the others.

The gaudy and moist flowers attract almost all insects, and so intricate is their structure, that the insects are crippled before they reach the nectar-store. If the visitor succeeds in escaping, he takes with him two bundles of pollen, or seed. This the insect distributes about the wayside, and in this way cross-fertilization is secured. This also accounts for the great abundance of the weed.

In the autumn large seed pods take the place of the blossoms. After the pods burst open, the seeds drift about for great distances from their place of origin. When the plant becomes a pest, heavy cropping will rid the ground of it. Otherwise, it is a very attractive foliage.

Milky Way, in astronomy, a luminous band of light extending quite around the heavens. It is produced by myriads of stars, each of which is supposed to be a sun like our own. In fact our sun is thought to be one of the stars of the Milky Way. This band of light is known also as the galaxy. In one point in its course, it divides into two great branches which remain apart for nearly one-third of the great circle, then reunite. The average width is several degrees. Various portions differ considerably in brightness. In places the stars are so distant that few of them are above the eighth magnitude. See STARS.

A broad and ample road, whose dust is gold,
And pavement stars,—as stars to thee appear
Seen in the galaxy, that milky way
Which nightly as a circling zone thou seest
Powder'd with stars.

—Milton, *Paradise Lost.*

Mill, John Stuart (1806-1873), a celebrated English philosopher. He was born in London, May 20, 1806. He died at Avignon, France, May 8, 1873. The father, James Mill, was a man of remarkable intellect, well known as a writer and as a man who influenced some of the greatest minds of the century. He took personal charge of John Stuart. He taught him the Greek alphabet in his fourth year, and by the time he was eight had him reading the Greek authors read usually in the high school course. John was a boy of unusual quickness and reasoning power. Probably no child of the nineteenth century had so rigorous an education. His father trained him to think as carefully as any jockey ever trained a horse to speed. Religious matters were never mentioned. Mill went through life without belonging to a church or having any denominational preferences. He was not an irreverent man.

In 1823 he entered the London office of the East India Company as an assistant to his father. He was soon placed in charge of the company's correspondence with its various agents in India, an exceedingly responsible position. Mill appears to have been able to do his work in office hours and to use the rest of his time systematically for reading, thinking, and writing. He contributed a great number of articles to the various reviews. He became the practical proprietor of the *Westminster Review* in 1837. His *Logic* was published in 1843, a *Political Economy,* in 1848; *Essay on Liberty,* in 1859; on the *Subjection of Women,* in 1869, etc. Friends persuaded him to stand for Parliament. He consented, but he declined to canvass or to employ anybody to solicit votes for him. He was very reluctant even to address a meeting of voters. He was elected and served for three years. He took a public stand in favor of the poor tenants of Ireland, the representation of women in Parliament, the reduction of the national debt. He was not reëlected.

Mill's *Autobiography* is one of the most interesting books of the sort ever written. It gives the details of his early education, his walks and talks with his father, and his determination to be of some use in the world. As a young man he was bent on reforming society. He was in many respects a socialist. He did not believe in the private ownership of land. He insisted that it was not right to hold land unless one were using it. He believed that the increase in the value of land, arising as it does from the efforts of an entire community, should belong to the community and not to the individual who might hold title. According to his views, no one should be permitted to become wealthy through an increase in the value of wild land or unoccupied town lots.

When about twenty years of age Mill passed through a period of deep despondency. Life seemed to him barren. He came to the conclusion very rationally that his life had been too strictly intellectual, and that he needed more of human society and the diversion of family life. Nevertheless he did not marry until 1851, and then he married a widow whom he had known intimately for twenty years. He was fond of scenery. Throughout his entire life he was an enthusiastic botanist. After retiring from Parliament he settled in a cottage at Avignon, France. He had a comfortable income. He surrounded himself with books and facilities for writing. He had a nook for a cabinet of plants. As spring came on he could hardly wait for the advent of flowers.

Mill was one of the most remarkable men of the century. He was intimately associated with Carlyle and other thinkers of his day. While some of his notions were not practicable, it may be said that very few writers have had a more positive and widespread influence than he. The following sentence is one of many that might be quoted: "The government of a people by itself has a meaning and a reality—but such a thing as government of one people by another does not and cannot exist."

Millais, mĭl-lā′, **Sir John Everett** (1829-1896), an English painter. He was born at Southampton. He died in London. He was educated in France. His first successful picture was *Pizarro Seizing the Inca of Peru.* He rose rapidly to an influential position among the artists of France and England, and at the time of his death was president of the Royal Academy of London, the greatest honor within the gift of his associates. Other pictures of some note are

Young Men of Benjamin Seizing their Brides, A Huguenot, and *Chill October.* Millais became in a way a court painter, having executed portraits of Beaconsfield, Gladstone, Salisbury, Ruskin, Tennyson, and other notables.

Miller. See MOTH.

Miller, Cincinnatus Heine (1841-1913), American poet known usually by his pen name of Joaquin Miller. He was a native of Indiana, but spent most of his life on the Pacific coast. He was by turns a miner, a lawyer, a judge, and an editor. He tried at first to sell his poems in the East, but, unable to do so, he took them to London, where they were published under the title of *Songs of the Sierras* and brought their author considerable fame. Other volumes of poems are: *Songs of the Sun Lands, Songs of the Desert, Songs of Italy,* and *Songs of Mexican Seas.* He produced several works of fiction: *The Baroness of New York, The Danites of the Sierras,* and *'49, or the Gold-Seekers of the Sierras.* Of the following quotations, the first is the opening stanza of Miller's well known poem, *Columbus;* the other gives a hint of the stand he took regarding his relations to his fellow men:

Behind him lay the gay Azores,
Behind the Gates of Hercules,
Before him not the ghost of shores,
Before him only shoreless seas.
The good mate said, "Now must we pray,
For, lo, the very stars are gone;
Speak, Admiral, now what shall I say?"
"Why, say, 'Sail on, sail on, sail on and on.'"

In men whom men condemn as ill,
I find so much of goodness still;
In men whom men pronounce divine,
I find so much of sin and blot,
I hesitate to draw the line
Between the two, when God has not.

Miller, Hugh (1802-1856), a Scottish geologist. He was born at Cromarty on the northeastern coast of Scotland. His father, a sailor, perished at sea when Hugh was five years old. Hugh learned much from his widowed mother and from two uncles, one a saddler, the other a carpenter. He received the typical Scottish inheritance of piety, integrity, and industry. As a child he was fond of the hills, the sky, and the heather bell. He enjoyed reading and was fond of writing, but did not like to attend school. At fifteen, he chose to be a stonemason, reasoning that it would give him leisure in the winter season for books and writing. Looking back upon this period of his life, he exclaimed, "Noble, upright, self-reliant toil, who that knows thy solid worth and value would be ashamed of thy hard hands, and thy soiled vestments, and thy obscure tasks,—thy humble cottage, and hard couch, and homely fare!"

In later years he wrote an autobiography called *My Schools and Schoolmasters.* It is an excellent book for boys. It treats of companions and toil, of tramps and travels in search of work, of reading and of writing, but not of schools in the ordinary sense of the word. He read Locke and Hume, Goldsmith and Addison. He wrote poems for the *Inverness Courier* and for the *Edinburgh Scotsman,* but, as they were not accepted by the editors, he imitated Burns by bringing out a little book entitled *Poems Written in the Leisure Hours of a Journeyman Mason.* Its reception convinced him that he was not born to be a poet, although the peasantry who had known him as a child now looked upon him as a genius. A volume of prose, *Scenes and Legends of Cromarty,* fared somewhat better. In 1834 he married a woman of superior social advantages and dropped the mason's mallet and chisel for the implements of a clerk in a bank.

When the great contest over the appointment of pastors came on in the Scottish church, Miller was one of the seceders. The leaders in the movement, who had detected his ability with a pen, placed him in editorial charge of the *Witness,* a paper published twice a week in Edinburgh in advocacy of the Free Kirk movement. This position he continued to occupy until the 24th of December, 1856. He became insane and died by a pistol shot fired by his own hand.

Ere he left Cromarty Miller had become interested in geology. He studied the cliffs of that vicinity and puzzled over the fossil remains found in the sandstone. He corresponded with Lyell, Murchison, and Agassiz. About 1840 he began to contribute a series of articles to the *Witness* entitled *The Old Red Sandstone.* These were afterward published in book form. They were regarded as a remarkable contribution to geology and won for him a reputation

as an original thinker and a geologist. In defense of the Biblical account of the creation, he also wrote *The Footsteps of the Creator* and *The Testimony of the Rocks.* With regard to the origin of species he stood by what he conceived to be the Biblical idea of special creation. He observed and communicated many facts of use to the evolutionist, but he stoutly opposed Darwin to the last. As a scientific thinker he is allied to Agassiz rather than to Darwin and Huxley. Some have thought that his reason was unsettled by an attempt to reconcile the facts of geology with the Biblical account of the creation in six days. He had been brought up to believe the Scriptures word for word, exactly as they are written. He interpreted the day of Genesis as a day of twenty-four hours rather than as a geological age.

Millet, a general name for several annual grasses of quick summer growth. All are related more or less closely to the foxtail and the barnyard grass. In the United States millet is sowed for hay usually when some other crop has failed to grow or has been destroyed by an early hailstorm. On strong land a crop of two or three tons to the acre, or even double that amount, can be raised in eight weeks' growth. Millet hay is not a favorite forage with live stock, but, when cut green and well cured, it makes a tolerable substitute for better hay, ranking fairly well with coarse corn fodder. It is a tolerable food for sheep and young stock. Millet seed is excellent for the poultry yard and is credited with increasing the supply of eggs. In Asia the millets are of much greater importance. From 35,000,000 to 40,000,000 acres a year are grown in India. Japan uses millet flour from 35,000,000 bushels of seed annually. Corea, China, Manchuria, and other Asiatic regions use enormous quantities of millet bread. The cultivation of millet is believed to have preceded that of all other cereals.

Millet, mē-yā′, **Jean François** (1814-1875), a noted French painter. He was born at Gruchy, near Cherbourg, October 4, 1814; he died at Barbizon January 20, 1875. He was educated at Cherbourg in the Academy of Design and won a scholarship that carried with it a sum sufficient to pay his expenses in the studio of Delaroche at Paris—this in 1837. For a time he painted Biblical subjects with but fair success. In 1848 he awoke to the fact that his heart lay in peasant subjects. He himself had not led a life of ease. He believed that he lost his young wife on account of the poverty-stricken way in which they were compelled to live. The turn in his art was marked by the appearance in the year named of *The Winnower.* He left Paris and took up his residence in a cottage at Barbizon, a village in the border of the forest of Fontainebleau.

From that time on he produced painting after painting—*The Sower,* a powerful young peasant striding across the field scattering seed wheat by hand; *Man Spreading Manure; The Reapers; The Gleaners; Death and The Woodcutter;* and *Feeding Her Birds.* Reputation came slowly at first, but in 1859 his *Angelus,* potato diggers folding their hands and bowing their heads in prayer as the tones of the parish bell float across the field, sold at auction for $32,000. Other pictures followed. Quite a number were bought by wealthy Americans. *The Water Carrier* is owned by the Vanderbilts. W. C. Whitney purchased *The Sower.* Rockefeller purchased *A Peasant Grafting a Tree.* Other Millet paintings owned in America are *The Turkey Tender, The Buckwheat Threshers, The Potato Planters, The Churners, The Potato Diggers,* and *Breaking Flax. The Angelus* is considered Millet's masterpiece. *The Man with the Hoe* is most talked about.

Millet left his cottage for Cherbourg during the Franco-Prussian War. Otherwise he lived among the peasants and painted them to the end. Other artists were attracted to the vicinity. The inns and cottages were thronged by artists who desired to see him at work, and Barbizon became for the time a center of greater interest than the studios of Paris.

As an interpreter of peasant life, Millet is the greatest artist that has put brush to canvas. His subjects are French and local, but his paintings, like Burns' poems, appeal to the world.

See BRETON.

Millinery, in the United States, the industry of making and selling women's hats,

bonnets, etc. In England the term includes dresses as well as headgear; and a milliner is one who furnishes bonnets, dresses, and complete outfits for women. The word millinery is used also to designate the goods usually sold by milliners, and includes not only finished headdresses, but all articles and materials used in their manufacture, as silk, velvet, ribbons, flowers, feathers, wire, mull, net, lace, beads, pins, buckles, fancy ornaments, braids, felt and straw shapes, and frequently neckwear, veils, combs, and ornaments for the hair. The words milliner and millinery are probably derived from the name of Milan, Italy, a city long famous for its silks and ribbons. The millinery business was at one time largely in the hands of men, but at present it is almost entirely a woman's business.

There is probably no industry which demands such attention to changing fashions as does millinery. The larger American firms send women abroad each year to learn in advance what the styles are to be and to make suitable purchases. A milliner in the smallest of villages must visit large cities frequently to get new ideas and keep abreast of the changing fashions. Materials, however, are not wasted as sometimes happens in other lines. Felt shapes may be blocked into new forms, straw shapes may be resewn. The foundations for many hats are made to order from wire and crinoline. Velvets, silks, ribbons, feathers, and flowers are always in demand, and even ornaments which have "gone out" may be taken apart and the different portions adapted by the milliner to some new form or fancy.

See HAT; BONNET; FLOWERS; FEATHERS; RIBBON.

Milling. See FLOUR.

Millville, N. J., a manufacturing city, is at the head of deep water navigation on the Maurice River and on the West Jersey & Sea Shore Railroad, 40 miles south of Philadelphia. The principal industrial plants of the city are engaged in making cotton goods, in bleaching and dyeing, and in making shirt waists, glassware and ironware. Agricultural produce and fish are the staples of commerce.

Millville has modern public schools, a library and a Federal building, and near the city is a pleasant recreation ground—Union Lake Park. In 1920 the population was 14,691.

Milner, Sir Alfred, First Viscount (1854-1925), noted English statesman and administrator, Secretary of State for War in 1918-19. He was born at Bonn, Germany, and educated at King's College, London, and at Balliol, Oxford. Sir Alfred was called to the bar in 1881, but later took up journalism, and was identified with the *Pall Mall Gazette* for a time. From 1889 to 1892 he was Under-Secretary of State for Finance in Egypt; was appointed chairman of the Board of Inland Revenue in 1892; and in 1897 was chosen for the double duties of High Commissioner for South Africa and Governor of Cape Colony. In 1900 Sir Alfred became administrator of the Transvaal and Orange River colonies, of which he was appointed governor in 1901. His conduct during the Boer campaign gave rise to much controversy in Great Britain; and because of opposition to his policy on Chinese labor, Sir Alfred resigned in 1905. He has always been an advocate of imperial federation, compulsory national service and tariff reform. He is the author of *The Nation and The Empire* and *England in Egypt,* and several other notable volumes.

Milo, a variety of durra grown in dry and semi-arid regions for forage. Like the other durras and the kafirs, milo is an African sorghum. The Colorado Agricultural College reports that 100 pounds of milo seed is equivalent to 90 pounds of corn for fattening steers. When cut in the bloom the plant makes excellent forage, especially if fed with alfalfa, linseed, or cottonseed meal. It is said that 25,000,000 acres in Colorado alone are adapted to the growth of milo. See KAFIR.

Miltiades. See MARATHON.

Milton, John (1608-1674), an eminent English poet. He was born in London, the son of John Milton, scrivener, and his wife, Sarah Jeffrey. The father, born of Roman Catholic parents, had been disinherited because he became a Protestant. He had succeeded, however, in acquiring a "plentiful estate" on his own account. He was an intelligent man of fine character. Of the

PROTECTIVE MIMICRY—INSECTS

1. Butterfly becoming (2) when at rest. 3, 4, 5. Other leaf imitators. 6, 7, 8. Wings completely hiding insects. 9. Pupa-case resembling broken twig. 10. Caterpillar apparently a dead branch. 11. Walking-stick. 12. Bark bug. 13. Female of agreeable tasting butterfly mimicking (14) a nauseous species while male (15) remains unchanged. 16, 17, 18. Beetles imitated by (19) a butterfly. 20, 21. Butterflies resembling ichneumon fly and wasp. 22. Bee-like beetle. 23, 24, 25. Harmless flies protected by likeness to stinging bees and wasps. 26, 27. Imitators of ants. 28. a. Wasp's nest mimicked by (b) cocoon.

mother, Milton himself says that she was "a most excellent mother and particularly known for her charities through the neighborhood." The boy John was destined from the first for the study of polite literature, his natural tastes and aptitudes according well with his father's plans for him. He tells us that at the age of twelve he studied frequently until midnight, thereby producing the first injury to his eyes. His father instructed him at first, teaching him, among other things, to play on the organ. He was next put under the care of Thomas Young, an efficient master, and when twelve years old went to St. Paul's School. The earliest English verses known to have been written by Milton were produced while he was a pupil at this school. They consist of paraphrases of the one hundred fourteenth and one hundred thirty-sixth psalms.

When, as he expresses it, he had "acquired various tongues and also some not insignificant taste for the sweetness of philosophy," he was sent to Cambridge. Owing to a pink and white complexion, and possibly also to his refinement of manner, he was dubbed "The Lady of the College," by his fellow students. Milton spent seven years at Cambridge, although he was once withdrawn from college for a time owing to a quarrel with his tutor. He won considerable notice for Latin as well as for English poems, and, although he was not a favorite, his abilities were recognized and appreciated by students and academic authorities alike.

After taking his master's degree in 1632, Milton retired to his father's estate in Horton. He had intended to become a clergyman, but decided that his views were not in accord with those of the church. He also considered studying law, but finally settled seriously to literature. To this period of six years, spent for the most part at Horton, belong Milton's minor poems. His *Ode on the Nativity* was in fact written before he left college. *L'Allegro* is a lively descriptive poem of mirth:

> Haste thee, nymph, and bring with thee
> Jest and youthful jollity;
> Come and trip it, as you go,
> On the light fantastic toe.

Il Penseroso is a poem of contemplative moods, not of grief, but of chastened thoughtfulness such as becomes one walking in a vast cathedral-like wood, or at Mt. Vernon, or in a great cemetery of the nation's dead:

> Come, pensive nun, devout and pure,
> Sober, stedfast, and demure,
> And looks commercing with the skies
> Thy rapt soul sitting in thine eyes.

Comus was written for a court entertainment to be acted with fairy costumes and masks. *Lycidas* is a dirge or lament for the death of a college friend, Edward King, who was drowned in the Irish Sea.

After the death of his mother in 1637 Milton traveled on the continent and, returning to England, settled in London and interested himself with the education of his nephews. The strife between Parliament and the king was now coming on, and Milton took up the cudgels for the Puritans, becoming known as the keenest writer of pamphlets in the party. His language is bitter, denunciatory, coarse and abusive. "Dunghill adversary," "envious gabble," "gaudy rottenness," "bestial tyranny," "obscene priest," "deepest gulf of hell," are mild expressions compared with others that may be chosen almost at random from the pages of his political pamphlets. Curiously enough Macaulay calls them "a perfect field of cloth of gold." They indicate the white heat in which the deeds of the day were wrought.

Soon after the beginning of the civil war Milton married. He was at this time a learned and austere man of thirty-four, deep in political controversies; his wife, a gay young girl of seventeen, daughter of a Royalist justice of the peace. She was evidently unhappy in the stern atmosphere of her husband's home, and after two months of married life she went to visit friends. She was to stay until Michaelmas, but when the time came she refused to return to her husband. As a result of this disagreement Milton issued several bitter pamphlets on divorce, which aroused much indignation and made for their author many enemies. After two years a reconciliation was brought about, and Mrs. Milton returned to her husband's home. She died in 1652, leaving him three daughters. About this time his overtaxed eyes gave out completely, and total blindness came upon him. He

married a second time. His wife, Catherine Woodcock, died within fifteen months. She is best known by Milton's beautiful sonnet written to her memory. His daughters, young and poorly taught, made sorry work of helping their blind father. They could write but little, and though he taught them to read Greek, Latin, Hebrew, French, and Spanish, they did not understand what they read and naturally rebelled at the wearisome task of reading. Doubtless the father asked too much and the daughters gave too little. Finally, in 1662, he married a third wife, Elizabeth Minshull, a young woman twenty-four years of age. She proved a devoted wife and, by her tact and good management, Milton was able to live in peace and comfort.

Meanwhile Milton's work had been almost continuous. After the execution of Charles I in 1649 he was made Latin Secretary to the Council of State, which office he filled until 1660. His was considered the ablest pen in the commonwealth. In that day documents of importance were written in Latin. On the restoration of the Stuarts, Milton retired into obscurity, broken-hearted at the overthrow of his hopes for England. He was for a time in danger from the vengeance of the Royalists. His property was lost and his circumstances straitened. He continued his literary work, however, and, while he sat in darkness, dictated his great epics, *Paradise Lost* and *Paradise Regained*.

While Milton was familiar with the Greek and Roman mythology, his ideas for *Paradise Lost* are drawn chiefly from the Bible account of Adam and Eve in the Garden of Eden, and the Anglo-Saxon poem of *Beowulf*. Satan, who sat "High on a throne of royal state," with "A mind not to be changed by place or time," and who thought it "Better to rule in hell than serve in heaven," is the central personage of this poem. He is not a Biblical character. Milton got his idea from Anglo-Saxon sources, and our ideas of Satan are from Milton, not from the Bible. Milton's Eve is an interesting study, revealing now and again what he would have had his own wife be. He is said to have received but twenty-five dollars an edition for *Paradise Lost*.

Samson Agonistes, Treatise on Logic, and *Tract on True Religion* are other works of this period. He was at work on *Theology,* later published under the title *Doctrines of Christ,* when death came to him in 1674. Milton's remains lie in the church of St. Giles, Cripplegate, London. The ablest article on the great poet's life and writings is Macaulay's *Essay on Milton.*

Milton is second to none but Shakespeare among English poets. By nature studious, he became a profound scholar, while losing none of his intense love of beauty and harmony. Living in strenuous times, he was zealous for his country, giving his eyesight at what he believed the call of duty, but he was disappointed in his hopes. He was obsessed from his earliest years with the conviction that it was laid upon him to write a great poem for the glory of his country. It is little wonder that his natural seriousness grew into an austerity that repelled rather than won affection and made him what he must ever seem to us, a grand but solitary figure.

QUOTATIONS.

The paradise of fools.

With ruin upon ruin, rout on rout,
Confusion worse confounded.

Better to reign in hell than serve in heaven.

Hail, holy light! offspring of heav'n first-born.

They also serve who only stand and wait.

Peace hath her victories
No less renown'd than war.

Or if Virtue feeble were,
Heaven itself would stoop to her.

Nor love thy life, nor hate; but what thou liv'st
Live well: how long or short permit to heaven.

Revenge, at first though sweet,
Bitter ere long back on itself recoils.

Who overcomes
By force, hath overcome but half his foe.

A mind is not to be chang'd by place or time.
The mind is its own place, and in itself
Can make a heaven of hell, a hell of heaven.

CRITICISMS.

Prince of poets.—Hazlitt.

First place among our English poets.—Addison.

John Milton, the poet, the statesman, the philosopher, the glory of English literature, the champion and the martyr of English liberty.—Macaulay.

There is no force in his reasonings, no eloquence in his style, and no taste in his compositions.—Goldsmith.

An appreciation of Milton is the last reward of consummated scholarship.—Mark Pattison.

It is certain that this author when in a happy mood and employed on a noble subject, is the most wonderfully sublime of all poets in the language.—Hume.

Milton is as great a writer in prose as in verse. Prose conferred celebrity on him during his life, poetry after his death; but the renown of the prose-writer is lost in the glory of the poet.—Chateaubriand.

Three poets in three distant ages born,
Greece, Italy and England did adorn:
The first in loftiness of thought surpassed;
The next in majesty; in both the last.
The force of nature could no further go;
To make a third she joined the other two.
—Dryden.

Milwaukee, the largest city in Wisconsin, is a port of entry and the county seat of Milwaukee County. The city is 82 miles east of Madison and 85 miles north of Chicago, on the west shore of Lake Michigan. It is served by numerous lines of lake steamers, but the Pere Marquette, Chicago, Milwaukee & St. Paul, Chicago & Northwestern, Grand Trunk and the Minneapolis, St. Paul & Sault Sainte Marie railroads, and by several interurban electric lines.

Parks and Buildings. Milwaukee occupies a larger area than do some cities that have a larger population, as a result of which it has been able to set aside at least a thousand acres of land for parks. The park system comprises more than thirty-five recreation spots. Juneau Park, which occupies an attractive position on the bluff overlooking the lake, is one of the most beautiful. It is wooded and well tended, and contains statues of the founder of the city, Solomon Juneau, and of Leif Ericsson. In Washington Park is a zoological garden; Mitchell Park is unusually attractive; and Lake Park, bordering on Lake Michigan, is most picturesque. This park system is linked together by broad, well paved boulevards that are as fine as any in the Union.

This city is the see of a Protestant Episcopal bishop and a Roman Catholic archbishop, and the churches are among the most handsome edifices — especially St. Paul's (Protestant Episcopal), the Immanuel Presbyterian and the Jesuit.

Among the attractive business structures are the Northwestern Mutual Life Insurance Company building, Marshall and Ilsley Bank and the Wells, Majestic and First National Bank buildings. Other noteworthy buildings are the post office, Layton Art Gallery, public library and museum, auditorium, the county building and the Federal building.

Institutions. The public school system of Milwaukee is modern and entirely adequate; it includes schools for the deaf and the blind, for business training, a boys' technical high school, a fresh air school and a girls' school of trades. Other educational institutions of note are Milwaukee-Downer College, Milwaukee-Downer Seminary, Marquette University, Concordia College, Milwaukee University School and a state normal school. The city has at least twenty hospitals, the most notable being Saint Mary's. Here are also located the Wisconsin Industrial School for Girls and the Milwaukee Protestant Home for the Aged.

Industry and Commerce. In former days Milwaukee was one of the principal centers of the brewing industry in North America, but the men and money that were employed in this industry have now largely been turned to other pursuits. The chief products, in point of value, of Milwaukee's manufactories are iron and steel and products of these, flour, grist and other mill products, packing-house products, leather, boots and shoes, heavy machinery, stoves, furnaces, furniture and heavy and light railroad equipment.

Lake vessels enter into the heart of the city by way of the Milwaukee River and its tributaries, the Kinnickinnick and Menominee rivers. This favorable situation, together with the wealth of the country lying along this part of Lake Michigan and the water boulevard, and rail connection with Chicago and other lake cities, accounts for the city's commercial importance. The principal items of the extensive trade are lumber, coal, flour, oats, corn, wheat, rye and barley, gathered from the surrounding country, and the products of the city's mills and factories.

History. It is generally believed that Louis Joliet and Pere Marquette were the first white men to visit the site of Mil-

waukee; they reached this point on the lake in the last quarter of the seventeenth century. The French established a fur-trading post here about a century later; but it was not until 1818 that Laurent Solomon Juneau and his followers built permanent homes here. Juneau secured grants of land from the Indians, more settlers came, and in 1838 the settlement was incorporated as a village by the Territorial legislature. A city charter was granted in 1846. Many settlers arrived in Milwaukee from Germany, and German customs were dominant in the city for many years. The population was 457,147 in 1920.

Mimicry, in zoölogy, a simulation of something else in form, or color, etc. A measuring worm, the larva of the geometrical moth, on the approach of a footstep will stand out straight from a branch and imitate a twig so perfectly that the observer puts out a finger to touch it to make sure it is not a twig. The thunderpumper or bittern will stand in a swamp with head and neck in a rigor, imitating a weed or tuft of grass till the passer-by is gone. A tree frog has the power of changing color to more closely resemble the surface on which it desires to be inconspicuous. It is said to be able to change its color from a dark hue to a light one in about twenty minutes. This is accomplished by a rearrangement of the pigment in the external cells of the body.

Quite distinct from voluntary mimicry, but often called by the same name, is protective mimicry or protective coloration. The autumn plumage of quails resembles dead grasses and leaves so closely that the hunter may be unable to see a covey less than twenty feet distant. The arctic ptarmigan and the snowy owl in winter plumage are so white that they are invisible against an expanse of snow. The katydid and the green grasshopper are inconspicuous in the growing grass. Gray locusts can scarcely be seen in a dusty plain. The northern hare and the weasel turn white when winter comes. The walking-stick looks like a dead twig; some of the crabs look like stones; the leaf butterfly of India folds its wings so like a leaf of the bush it visits that even a bird is unlikely to see it. These are but a few of the many instances of protective mimicry.

Of course this sort of protection is beyond the power of the animal concerned. It is the result of natural selection carried on for it may be thousands of years. The individuals of a species that most nearly resemble their surroundings are most likely to be overlooked by hungry enemies, and are on that account most likely to be left to produce young to perpetuate the species. If this process of selection be kept up indefinitely, the protective shape or color becomes the standard shape or color of the species.

Although beyond their power to change, animals seem keenly aware of the degree to which their color protects them. One writer speaks of a woodcock that had so great faith in the resemblance of her plumage to the leaves about her, that she would permit the observer to approach within a few feet of the nest before she took wing; but a light snowfall having occurred, this in April, the wary bird made off ere the observer had come within fifty feet of the nest. The whip-poor-will nesting in a footpath sits in confidence, like a fluff of forest leaves, until almost trodden upon.

Mine, Submarine, in naval warfare, a large charge of some high explosive in a watertight shell or casing, placed under water at such a depth that, by its explosion, it may sink or seriously damage a vessel passing in its vicinity. Such mines are of two principal classes, namely, (1) contact mines, designed to explode by contact with the vessel; (2) observation mines, designed to explode at the will of an operator on shore, by the closing of an electric circuit connected to the mine when he observes an enemy's vessel passing over it.

Mines are also distinguished as ground mines, which rest on the bottom, and buoyant mines, which are anchored to the bottom but remain suspended in the water below its surface by their buoyancy. Dormant mines are contact mines which are ordinarily held down to the bottom, but which can be released at the will of an operator on shore, and then become buoyant mines. An electro-contact mine is one controlled by an electric circuit by which its

condition can be tested, and by which it can be made temporarily safe for the passage of friendly vessels.

Submarine mines are used for the defense of harbors and channels, and are usually arranged systematically in groups. Such a group is called a mine-field, or this term may be applied to a body of navigable water in which submarine mines are anchored for the purpose of preventing an enemy's ship from entering a channel, harbor, or roadstead. The mines may be so arranged that they can be exploded from a station on shore or may be contact mines which explode on being struck by a vessel. The mines are charged with guncotton, trinitrotoluol (TNT), or some other very powerful explosive. Modern submarine mines contain from 200 to 1,000 pounds of explosive, and those used freely by the Germans during the World War probably contained a minimum of 500 pounds. The effect of such a charge, when exploding against the side or keel of a vessel, is devastating; it tears a large jagged hole through which water enters in sufficient volume to cause the sinking of the ship in a few minutes.

The greatest mine-fields of the war were those laid by the Germans in the North Sea and across ordinary trade routes, contrary to international law. The British also mined their coasts, but warned neutrals of the limits of their mine-fields, and furnished convoys through them to neutral vessels. Many neutral merchant vessels, including Swedish, Danish and Norwegian ships, were sunk by German contact mines in the early years of the war. British naval losses through submarine mines were severe, and included battleships, cruisers, gunboats, torpedo vessels, submarines and auxiliaries.

A modern mine-laying ship puts to sea with a row of contact mines on rails along her side, ready for dropping into the sea. The rails project over the stern. The essential parts of a typical contact mine, as used during the war, consist of (1) the mine proper, comprising the explosive charge and detonating apparatus in a spherical case; (2) a square-shaped anchor chamber, connected with the mine by a length of cable; (3) a plummet weight, used in placing the mine in position, connected with the anchor chamber by a rope. Thus the mine appears on the deck of the mine-laying ship before being lowered over the stern.

Before the mine goes over, a windlass inside the plummet sinker is revolved by hand until the length of cable between the plummet and the anchor chamber has been reeled off equivalent to the depth below the surface at which the explosive mine is to float.

Then the entire apparatus is hove overboard. The plummet and anchor chamber sink, while the spherical mine proper is kept on the surface for the moment by means of a buoyant air-chamber within. A windlass in the anchor chamber now automatically pays out the cable between it and the mine as the anchor chamber sinks. On the plummet touching bottom, the tension in the cable between it and the anchor chamber is lessened, and the windlass mentioned stops. The anchor chamber thereupon sinks to the bottom, dragging down the spherical mine until the latter is at the selected depth, ready for its deadly work.

Contact or self-acting mines, which are most commonly used, have pins or levers on the outside of the case. When one of these is struck by a passing vessel, the pressure drives a firing pin against a fulminate primer in contact with the explosive charge.

Mines are removed from mine-fields either by sweeping or by countermining. Sweeping is generally performed by two vessels of shallow draft, dragging a long wire rope or cable between them. When caught in the rope, the mines are exploded by gunfire or a detonating charge. It is of course dangerous work. Countermining is the explosion of mines in a field by means of other mines electrically controlled.

Mineralogy, the science which treats of the properties of the various species of minerals, and teaches how to distinguish and classify them. It also investigates the occurrence of minerals in nature, with reference to their mode of formation and the alterations which they may have under-

gone. In a broad sense, it includes the investigation of minerals in their mutual relations as parts of rock-masses; but the study of rock-masses with respect to their history or occurrence as parts of the earth's crust is the function of geology. The principal branches of mineralogy are: (1) physical mineralogy, which deals with the physical properties of minerals, as related to cohesion, heat, light, electricity, etc., this branch includes crystallography, or the study of crystal formations; (2) descriptive mineralogy, which is devoted to the description of the physical and chemical properties of minerals; and (3) chemical mineralogy, or the investigation of the chemical composition of minerals, their methods of formation, and the changes they undergo when acted upon chemically either in the laboratory or in nature. Mineralogy is a science useful to the mining engineer in his search for metal-producing minerals, and to the metallurgist in the extraction of metals from ores and other mineral formations.

Mineral Products of the United States. The total value of the mineral products of the United States in 1920, as reported by the Geological Survey was $6,707,000,000, bituminous coal leading with a value of $1,950,000,000, and pig iron coming next with a value of $1,137,926,882. The production of gold amounted to $49,509,400, coining value; silver, $57,420,325, commercial value; and platinum, $4,697,722. Lead to the value of $76,296,000 was produced, zinc valued at $72,907,000, and copper valued at $222,467,000. Clay products totaled $364,220,000; stone, $120,500,000; cement, $194,513,000, and natural gas (1919) $162,000,000. The figures for quantity production of leading mineral products in 1920 were:

Bituminous coal, tons	556,563,000
Anthracite coal, tons	79,500,000
Petroleum, barrels	443,402,000
Iron ore, tons	69,558,000
Phosphate rock, tons	4,103,982
Asphaltum, tons	886,500
Copper, pounds	1,209,061,040
Cement, barrels	96,944,000
Salt, barrels	49,751,343
Zinc, tons	450,045

Many are becoming alarmed lest our supply of useful minerals be exhausted. From a chemical point of view, it is true that not an atom of any mineral can be annihilated or destroyed, but it is none the less probable that once the mineral atoms that have accumulated in the earth during geologic ages have been scattered, not all the ingenuity of man can gather them together again. It is quite possible that aluminum, as plentiful as clay, and sunshine, the gift of the sun, may take the place of iron and coal; but none the less it behooves a thoughtful people to be frugal in the use of nature's bounties.

Minerals, the substances which in the aggregate constitute the earth's crust. A mineral is an inorganic body occurring in nature, having a definite chemical composition which can be expressed by a chemical formula, and also having certain physical characteristics by which it can be distinguished. A mineral is in almost every case a solid body, and if it has been formed under suitable conditions it has, besides its definite chemical composition, a definite structure of its molecules, which may be shown externally in crystalline form and internally by the manner in which it divides when broken or crushed, also by its behavior with respect to light, heat, electricity, etc. Even when found in a mass, and not in the form of crystals, a mineral has other characteristics by which it may be distinguished, such as its specific gravity, hardness, fracture, tenacity, color, luster, fusibility, etc. Chemical compounds formed in the laboratory or in the arts are not regarded as minerals; but where such compounds as are already known as occurring in nature are thus formed by the chemist, they are usually called artificial minerals.

It is well to distinguish clearly between the terms "mineral" and "metal." The metals are elementary substances, which may be found in combination with other mineral bodies or distinct from every other mineral substance. Coal is a mineral, but it is not a metal. A metal is said to be mineralized when it exists in combination with those substances which take away its metallic character and convert it into an ore, in which the elementary substance

exists but often with characteristics greatly differing from those which it has when it is separated from its mineralizers, or exists by itself. An ore is a mineral containing a metal which may be extracted from it with profit, but not all mineral substances are ores; thus ordinary sandstone is a mineral containing some iron, but it could not be called an ore of iron.

The oldest known metals in the world, gold, silver, copper, iron, lead and tin are all produced in the United States, with numerous other metals that were unknown to antiquity, and among the non-metallic mineral products are the following: Asbestos, asphalt, borax, cement, clay, coal, coke, fuller's earth, graphite, lime, mica, natural gas, peat, petroleum, potash, salt, sand and gravel, slate, sulphur, talc, soapstone, etc. Gems and precious stones including the diamond, opal, topaz, turquoise, sapphire, tourmaline and quartz are all classed as minerals.

The ores of heavy metals are frequently of such low grade that the metal formerly could not be extracted economically. Thousands of tons of valuable minerals would therefore still remain unworked except for the scientific methods of concentration now employed. An ore containing one per cent of tin will now repay treatment. It cannot be smelted, but a complex process of table washing, roasting, and washing again concentrates it to 60 to 70 per cent., ready for the smelter. Low grade sulphide ores, graphite ores, and other minerals are concentrated by one or other of various methods of oil separation and flotation devised by chemists in comparatively recent years, and important work in the separation of minerals has also been done by electrical and mechanical engineers, to whom credit is due for the invention of magnetic separators. Many ores containing magnetic minerals are now efficiently treated by these machines, involving both wet and dry methods. One instance is the magnetic concentration of magnetite ores, and the separation of this mineral from pyrites. Magnetite, limonite and hematite, the important ores of iron, are among the chief minerals mined, and are all oxides. Hematite is by far the most important of these, making up more than 90 per cent. of the iron ore mined in the United States.

Mineral Waters, See WATERS, MINERAL.

Mineral Wool, fibrous wool-like material, reminding one of spun-glass. It is a poor conductor of heat and is used as packing for steam pipes and for similar purposes. It is a product of slag, or rock, and is made by blowing a jet of air or steam through such material when in a molten state. Slag wool was manufactured first in Germany about 1870. Rock wool was produced later and commanded a higher price on account of the small percentage of sulphur which is found in slag wool, and which, if water reaches it, may give rise to the formation of sulphuric acid which is injurious to the pipes. Over eleven thousand tons of mineral wool were produced in the United States in 1909. Its value was estimated at $101,621. Mineral wool is used also as a sound-proof lining for floors. Cotton fiber and silicate cotton are other names for mineral wool.

Minerva, in Roman mythology, the goddess of wisdom. The first syllable of the name is the same root as that which appears in the English word, mind. She was the daughter of Jupiter, the counterpart of the Greek Athene, the daughter of Zeus. Though wisdom is of slow growth, Minerva sprang from his brain full grown and clad in armor. In case of attack she was a warlike goddess, but she had no desire for foreign conquest,—no sympathy with Mars, the god of war, violence, and bloodshed. She presided over agriculture and commerce and household arts—spinning, weaving and embroidery. She gave mortals the olive and taught them how to cultivate it. In art, Minerva, like Athene, is represented in full drapery with helmet, shield and spear. She ranked with Jupiter and Juno, and, with them, the center of her worship was the great temple on the Capitoline Hill. The wise-looking owl is called the bird of Minerva. See SPIDER; ATHENE.

Minimum Wage, in political economy, a term used, sometimes interchangeably with "living wage," to designate such a rate of remuneration for labor as will en-

able the workman, without an amount of exertion that is injurious to health, or unduly burdensome, to procure whatever is necessary to maintain himself and his family in a degree of comfort which is fitting for persons of their class. The term is exceedingly flexible, sometimes referring to a wage which merely affords somewhat more than the necessities of physical existence, sometimes to a wage which would make possible a high degree of intellectual, social, and moral development. In many cases it is used to refer to the wages of women workers or minors.

Many investigations have been made by social reformers in the United States to determine just what constitutes a minimum or living wage for various classes of workers, but these efforts have not usually met with much success, for several reasons. In the first place, the ideas of those who work for wages and those who would seek, from altruistic motives, to better their condition in life, invariably differ widely as to the amount to be allotted for living expenses in making such a calculation. It is natural for the workers in any given employment, or of any given class, to rate their minimum requirements higher than others would do it for them. Secondly, the matter of location affects the costs of living. Hence where minimum wages have been arrived at in the settlement of any labor controversy, or in connection with proposed legislation, compromise has usually been resorted to, with results not always satisfactory to either side.

In 1910 it was estimated that the minimum amount of annual income required to support a normal working-class family of five in American cities varied from somewhat under $600 to $800 or a little more, according to the prices prevailing at that time. In 1914, when the European war broke out, prices began to advance and reached their summit in 1920 and 1921, with a corresponding increase in wages in most industries, especially those directly concerned in wartime activities. The minimum wage figures of the pre-war years therefore no longer applied, and during the period of reconstruction, or rather reaction, after the war, the struggle of organized labor to maintain the high wage rates of wartime, with a continuance of increased prices for nearly all the necessities of life, made it difficult to arrive at any just estimate of the minimum wage requirements of any class. The term "living wage" then came into general use, and organized labor contended unceasingly for higher rates of remuneration, claiming that the higher standards of living achieved by the American workman during the war must be maintained. The great railway shopmen's strike and coal miners' strike of 1922 were determined protests against attempts to reduce the wages in those industries from wartime levels. In April, 1923, the prices prevailing in the United States were such that the purchasing power of the dollar was only about 60 cents compared with its value to the possessor in 1914. This showed an increase in purchasing power over the condition in 1920 and 1921, but the difference was still large enough to make all pre-war estimates of minimum wage requirements entirely insufficient.

Minimum wage legislation was first undertaken in Australia, where the legislature of Victoria in 1896 created boards to fix minimum wages in several important trades. In 1915 the operation of the law was extended to cover more than a hundred trades, employing some 150,000 workmen. Before the war nine American states had enacted minimum wage laws, to apply to certain specified industries, and some of these states provided for commissions with power to fix rates legally binding upon employers. But for constitutional reasons, all of these state laws were limited in their application to women and minors; and in April, 1923, the United States Supreme Court declared such legislation affecting women to be unconstitutional, on the ground that it interferes with the individual's right to contract for personal services.

Employers in the United States are generally, for various reasons, opposed to setting up the minimum wage principle in industry. One reason adduced is that the establishment of a minimum wage is an unwarranted interference with the economic law of supply and demand; another

that to compel all concerns in any branch of industry to pay a minimum wage deprives some of them of the opportunity to meet competition, and concentrates production in the hands of concerns of large capital, better able to pay high wages. The question of a minimum or living wage appears therefore to be one for settlement by mutual agreement between employers and employed, rather than by legislative enactment. See LABOR LEGISLATION.

Mining, the business of obtaining useful minerals from the earth's crust. Most minerals are found in a more or less horizontal layer called a stratum, bed, or seam. Sometimes several strata, separated by intervening layers of earth or rock, occur together. When for any reason the mineral stratum is at the surface of the earth, mining is a simple operation. Sometimes river valleys have cut through many strata exposing those in which minerals are found. In such a case, galleries are excavated through the mineral vein, enough of the mineral being left in places to support the overlying weight of earth or stone. Ordinarily, however, it is necessary, first of all, to send down a central shaft from which passages are constructed in various directions. The mineral is brought to the shaft on underground tramways and is hoisted to the surface. In the case of vertical mineral veins, a sloping shaft is not infrequently constructed.

A tin mine in Cornwall, England, extends far out under the sea. One of the deepest mines in the world is the North Tamarack copper mine in upper Michigan. It lacks eighty feet of being a mile in depth. The Red Jacket shaft of the Calumet and Hecla is down more than 5,000 feet most extensive as well as the most curious mines in the world are the famous salt mines near Cracow, in Austrian Poland. For ease of working the surface iron mines of northeastern Minnesota are unexcelled.

Mining is one of the most ancient occupations. Mining engineering is a distinct profession in itself. The engineer requires to have a knowledge of mathematics, mechanics, physics, and mineralogy. Special schools of mining engineering have been established in all the leading countries. The first school of mining in the United States was established at Columbia University. Schools of mines or departments of mine engineering are maintained in most of the states and in the Canadian provinces.

In the United States mining is second in importance to agriculture only. The total value of the mine and quarry products in 1921 was $4,056,000,000; in 1920 it was $6,951,410,000. In view of the increasing need for metals and the impossibility of renewing the ore supplies, experimental stations of the Bureau of Mines have been established in the mining districts to investigate and solve the problems of the industry, and secure the utmost economy in mining methods and so prevent waste of a great national resource.

Minister, the official title of the directing head of a government department, as Minister of Munitions, etc., and of an official delegate or representative of one country in another country. Strictly, only sovereign states have the unqualified right to send representatives to other such states, and only the ministers of such states possess the representative attributes in the highest degree. Among federated states, ministerial rights depend entirely upon the terms of confederation and the constitution. Unless otherwise specified in the terms of a treaty, every sovereign state has the right to receive the ministers of other states. There are several orders of ministers, the powers of each order depending upon the nature of its function, and each enjoying different privileges under the home government.

In the United States system, diplomatic ministers who are to function for their country at foreign courts are appointed by the President and the appointment is confirmed by the Senate. See AMBASSADOR.

Ministry, in government, the advisory combination of the heads of the various administrative departments. This body functions as an advisory board to the chief executive or directs the internal and external affairs of a state. In England, Canada and Australia the term "minister" is directly applied, as Minister for Foreign Affairs, Minister of Marine and Fisheries,

etc., while in the United States the term in use is "secretary," as Secretary of the Treasury, etc.

The presiding officer in the British ministry is the Prime Minister (Premier); in the Canadian ministry, the Prime Minister; in the United States, the Secretary of State. The members of the ministries of England, Canada and Australia must be members of the respective Houses of Commons; and, generally, the right of choosing the members of the ministry belongs to the executive head of a country.

Mink, a valuable fur-bearing animal belonging to the weasel family. The American mink is much larger than a weasel. Its body is about eighteen inches long, the tail about six. It is one of the most valuable North American fur animals. It is yet trapped systematically in the Hudson Bay country. Like the otter, it lives in ponds, rivers, and their banks, but feeds on a less exclusive fish diet. It is fond of fish and pursues them with great skill, but it is quite as well satisfied with a muskrat, a grouse, or a quail. The mink is quite an adept at concealing itself in the bank of a stream in well settled countries, and is given to visiting the poultry yard at night. It is dreaded especially on account of a bloodthirsty habit of cutting the throats of fowls, destroying oftentimes several valuable birds in a single night. Some attempts have been made to breed it for its fur. It has its full share of the musky odor which pervades the weasel family. The mink is literally "as quick as a weasel," which is saying a good deal. In running, the mink plants its hind feet in the tracks of its fore feet so that its track in the snow has the appearance of being made by an animal hopping along on two feet. A raw mink pelt is worth from five to fifteen dollars according to season and current demand. The decree of fashion recently for this fur has greatly increased its price.

See Fur.

Minneapolis, the metropolis of Minnesota and the county seat of Hennepin County, is situated on the Mississippi river at the Falls of St. Anthony, 424 miles northwest of Chicago and 167 miles southwest of Duluth. The city is divided into two unequal parts by the river; the larger section is on the west bank. Ten miles east is St. Paul; the two cities are joined by interurban lines and between them lie continuous suburbs. These are the well known "Twin Cities" of Minnesota.

Minneapolis is built on a broad plateau that has an approximate elevation of 800 feet above sea level. Within the city are several lakes; the Falls of St. Anthony are in the heart of the manufacturing district; and the river is spanned by numerous concrete highway bridges and steel railroad bridges.

By canalization the river has been made navigable to Minneapolis, and besides the steamers that serve the city, service is afforded by upwards of nine principal lines of railroad. These include the Minneapolis & St. Louis, the Chicago, Milwaukee & St. Paul, Chicago & Northwestern, the Northern Pacific, the Minneapolis, St. Paul & Sault Sainte Marie, the Great Northern, the Chicago Great Western, the Chicago, Rock Island & Pacific and the Burlington. Passenger trains of six railroads use the Great Northern Station, called the Union Station. The Chicago, Milwaukee & St. Paul station is a commodious building used by that road and two other roads.

Parks and Public Buildings. The area of Minneapolis is approximately 54 miles and the park area is 4,020 acres, about one acre in nine for park purposes, or one acre to every hundred people. The largest single park is Glenwood, with an area of 682 acres. This has one of the two eighteen hole municipal golf links. The park system comprises about fifty places of recreation, and these are linked together by a wide boulevard fifty miles long. In the southwestern part of the city is a series of four lakes surrounded by lawns and wooded retreats of great beauty; the lakes are bound into a chain by clear waterways that are navigable for canoes and rowboats. In Minnehaha Park, on the creek of the same name, are the Falls of Minnehaha, fifty feet high; the Minnesota Soldiers' Home adjoins this park. Loring and Gateway parks, in the center of the city, are notable.

The number of handsome buildings in Minneapolis is constantly increasing; some

A Group of Butte (Mont.) Mines

Standard-Mammoth Mills at Wallace, Idaho

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PRECIPITATING VATS AT A SOUTH AFRICAN GOLD MINE

are notable for their height and modernity; some for the beauty of their construction; and many for both these features. Among the most notable are the Minneapolis Institute of Art, the court house and city hall, Federal building, Great Northern Station, post office, public library, Central High School, the Schubert, Hennepin-Orpheum and Auditorium theaters, the Radisson, the Curtis, the West, the Leamington, the Dyckman and other hotels, numerous bank buildings, including the Metropolitan, Federal Reserve and Northwestern National Bank, Security and Soo, the Cathedral of St. Mary, Hennepin Avenue Methodist Episcopal Church (which has probably the largest gallery of sacred art in the country), Westminster Presbyterian and St. Mark's Episcopal churches.

INSTITUTIONS. The most important educational institution is the University of Minnesota (See MINNESOTA, subhead *Education*), situated on the east bank of the Mississippi. Others are Minnesota College, Saint Maragaret's Academy, Stanley Hall, Graham Hall, Minneapolis School of Fine Arts, Northwestern Conservatory of Music, Dunwoody Institute, Blake School, de la Salle Institute, Augsburg Seminary, McPhail School of Music and numerous special commercial, and vocational schools. The city is the home of the well known Minneapolis Symphony Orchestra.

There are a number of settlement houses in Minneapolis; several free dispensaries; a Catholic Orphan's Home; Washburn Home; and Saint Mary's, Minneapolis City, Asbury, Northwestern and other hospitals.

INDUSTRY AND COMMERCE. Minneapolis is so situated, with reference to the grain and lumber producing region to the north and northwest and with reference to an abundance of water power, that flour and lumber milling are the chief industries. It is the greatest flour producing city in the world, and has the largest single flour mill in the world. The mills are situated near the Falls of St. Anthony. Lumber milling once held first place, but the gradual deforestation of the regions closest to the city as well as the improvement of the flour milling process wrought a change. This city contains upward of fifty grain elevators, with a capacity in excess of 55,000,000 bushels, and is the largest primary wheat market in the world.

Minneapolis is the principal manufacturing center in the country for linseed oil, and the leading market in the country for barley. It also leads all cities in the manufacture of farm tractors.

Other industrial establishments are engaged in producing clothing, boots and shoes, iron and steel products, furniture, linseed oil, paper, agricultural implements and machinery and many other commodities. The city is the wholesaling center for a great extent of surrounding territory.

HISTORY. One of La Salle's followers, the Jesuit Father Hennepin, discovered the falls of the Mississippi here in 1680 and gave them their name. The next visitor was one Jonathan Carver, who reached the falls by way of the Mississippi in 1766; he published a description of the falls and the surrounding country, laying stress on their beauty and commercial possibilities. Lieutenant Pike visited this region in 1807 to establish peace between the Sioux and Chippewa Indians as well as to advance the interests of the United States as against England on the upper Mississippi and the Minnesota rivers. From the Sioux he secured a strip of land extending from the confluence of the Mississippi and the Minnesota nine miles on each side of the Mississippi, including a large part of the present site of Minneapolis. Settlement was first made on the east side of the river, which became known as St. Anthony. The reservation on the west side was not formally opened to settlement until 1855-1856. St. Anthony and Minneapolis were merged in 1872. Colonel Leavenworth built Fort Snelling here in 1820. The United States built a flour and lumber mill in 1823. Squatters went onto the Fort Snelling reservation, among them a number of officers from the fort who had taken the choice spots. A village of considerable size grew up; the squatters' claims were legalized in 1855; in 1856 the settlement was chartered as a town; and as a city bearing the name of Minneapolis, in 1867. Minne-

apolis had 301,408 inhabitants in 1910; 380,582, in 1920.

See HENNEPIN; MINNESOTA; MINNEHAHA.

Minnehaha, a cascade in Minnehaha Creek, the outlet of Lake Minnetonka, Minnesota. Minnehaha Park is situated on the western shore of the Mississippi, below the Falls of St. Anthony, but within the corporate limits of Minneapolis. The cascade falls over a limestone ledge into a wooded glen about sixty feet deep. The glen widens and deepens for about a mile, until it opens into the gorge of the Mississippi. This cascade is the Minnehaha Falls or "Laughing Water" of Longfellow's *Hiawatha.* The name is said to have been applied by the Dakotas to the Falls of St. Anthony instead. See HIAWATHA.

Minnesingers, a name given to the early German lyric poets, especially of the twelfth and thirteenth centuries. The name is derived from *minne,* meaning love. This was the predominant subject of their songs. They correspond in a way to the troubadours of France, the gleemen of the Anglo-Saxons, the minstrels of the Normans, and the bards of Britain. Frederick Barbarossa, emperor of Germany, encouraged the minnesingers. They composed songs in praise of women and odes for occasions of public joy or distress, as well as ballads of love. The composer sang his own songs to the accompaniment of the viol. The composition of the minnesingers is supposed popularly to have been graceful and agreeable to the ear. Their native home was upper Austria. They wandered from castle to castle, even beyond the boundaries of Germany, singing their productions. The student of literature regrets that, with the invention of printing, the minne songs were not regarded worthy of preservation. Hymns, monkish legends, and paraphrases of the Scriptures completely suppressed the songs of the chivalrous minnesingers. The few songs preserved are considered a noble beginning of German literature. They compare favorably with the ballads of Great Britain. The minnesingers whose names the intelligent reader is most apt to meet are Walther von der Weide, Wolfram von Eschenbach, Gottfried von Strassburg, and Hartmann von der Aue.

Longfellow in his poem, *Walther von der Vogelweid,* relates a story of this poet to the effect that, at his death, he left his treasures to be used in feeding the birds daily on and about his grave.

> Saying, "From these wandering minstrels
> I have learned the art of song:
> Let me now repay the lessons
> They have taught so well and long."

See MEISTERSINGERS.

Minnesota, "The Gopher State," one of the north central states is located almost in the geographic center of North America. It is bounded on the north by the Canadian provinces of Manitoba and Ontario, on the east by Lake Superior and Wisconsin, on the south by Iowa and on the west by North and South Dakota. The Lake of the Woods, Rainy River and Pigeon River are on the northern boundry. The St. Croix River and the Mississippi River mark the greater part of the boundary between Minnesota and Wisconsin, and the Red River of the North separates the state from North Dakota. The greatest length from north to south is 410 miles, the greatest width from east to west is 380 miles and the area is 84,782 square miles.

SURFACE AND DRAINAGE. The highest point of land in the state is in St. Louis County in the northeastern section where some elevations in the Mesaba and Vermillion mountains reach a height of 800 feet. Near these mountains, also at the head of Lake Superior, is the lowest point in the state. A height of land extends across the north central part of the state in an irregular direction from east to west and separates the waters into three great river systems—the St. Lawrence, the Mississippi and the Hudson Bay. The state contains over 10,000 small lakes most of which are surrounded by timber. The largest number are in the north central part. Most of these lakes are shallow and small. Red Lake, the largest, has an area of 324 square miles. Big Stone, Traverse, Rainy and Pepin are formed by the expansions of rivers; the others are the result of glacial action. Their waters are clear and cold and abound in fish. These lakes are one of the most interesting features of the state.

MINNESOTA

1. Barley
2. Flax
3. Logging
4. Wheat
5. Potatoes
6. Fishing
7. Clover
8. Oats
9. Manufacturing
10. Fruit
11. Quarrying
12. Flour
13. Hay
14. Rye
15. Corn
16, 19. Iron
17. State Flower
18. Dairying

The surface in general is rolling prairie except in the north where there are many low hills, and the largest part of the region is covered with forests. The Red River valley is broad and flat and expands as it extends northward into Manitoba. The central and southern parts of the state consist of rolling prairie and in the southwest there are occasional low hills, some of which Longfellow in his poem *Hiawatha* characterizes as "mountains of the prairie."

The Mississippi River, which has its origin in the north central part of the state, with its tributaries drains the greater part of the surface. The most important of these tributaries is the Minnesota which flows easterly across the southern part of the state and joins the Mississippi at St. Paul. The St. Croix, which joins the Minnesota a short distance below St. Paul, is navigable in its lower course. The Mississippi is navigable for river steamers up to Minneapolis.

Climate. A clear, dry atmosphere with many bright sunny days forms the leading characteristic of Minnesota's climate. The winters are cold and occasionally the thermometer falls to 35° or 40° below zero. In the summer the thermometer may reach 90° to 100° but owing to the dryness of the atmosphere these extremes of temperature are not felt as in the regions of greater humidity, and extremes of heat or cold are usually of short duration. Everywhere the climate is pleasing and healthful and Minnesota is a favorite resort during the summer.

The rainfall averages 20 inches, but since most of this occurs during the growing season it is sufficient for agriculture. The northern half of the state is usually covered with snow during the winter and this assists very materially in supplying the moisture for growing crops.

Minerals. So far as is known Minnesota contains the largest deposits of iron ore in the world. These deposits are located chiefly in St. Louis County and in the Mesaba Range, the Vermillion Range and in the Cayuna Range further to the southwest. The former exists in the form of decaying rock and nearly all the mines are surface mines, the ore being transferred from its bed directly to the cars by means of steam shovels. The cars are run to Duluth and Two Harbors, where they are unloaded into immense chutes from which the ore is transferred directly to steamships and transported to Cleveland, Chicago and other iron and steel centers on the lower lakes. The average output of these mines a season is about 40 million tons of ore and in 1918 it exceeded 43 million tons. Other mineral deposits are relatively of slight importance. Granite is found near Big Stone and St. Cloud. Kasota limestone is widely used for building purposes and there are large quantities of clay, suitable for brick and tile, distributed throughout the state. Pipestone County takes its name from a small outcropping of pipestone, a clay rock which was originally used by the Indians for making the Calumet or peace pipe, smoked on all ceremonial or tribal occasions. This is the only part of the United States in which this rock is found.

Forests. Formerly the "Big Woods" of the Sioux Indians consisted of extensive forests of oak, maple and other hardwood trees extending almost across the state. Most of these forests have been thinned out but many small areas still remain throughout the lake region. Large forests of white pine and evergreen trees exist in the northern part of the state and Minnesota leads in the production of white pine lumber.

Several disastrous forest fires have destroyed thousands of feet of excellent timber and to prevent, as far as possible, further loss from such disasters the office of state forester was created and numerous stringent laws were enacted. While these measures have not been wholly successful, the loss from forest fires has been reduced.

Agriculture, is the chief occupation of the people, and over 53 per cent of the land is in farms. In 1920 there were 178,478 farms in the state which was an increase of 14.3 per cent during the decade 1910-20. Two-thirds of the land in farms is improved. The most valuable crops in the order of their importance are Indian corn, wheat, oats, hay, forage crops and pota-

toes. Large quantities of flax are raised in the northern part of the state. This region is also rapidly developing into a stock raising and dairying section and Minnesota is becoming known for its high grade cattle and horses. The annual dairy output amounts to about 40 million dollars.

MANUFACTURES. The 1920 census gives the following data for industrial organizations under the factory system:

Number of establishments	6,225
Persons engaged in manufacture	147,665
Primary horse power	473,000
Capital invested	$690,386,486
Material used	$883,089,777
Value of products	$1,218,129,735

The leading industries are closely related to the raw material produced in the state. Minnesota leads all other states in the production of wheat flour and Minneapolis is the largest flour producing center in the world. Following this in the order of importance is slaughtering and meat packing, which is carried on chiefly in South St. Paul. Lumber interests, owing to the depletion of forests, have fallen to third place and this is followed by dairying. A large steel plant near Duluth has greatly increased the output of iron and steel products. The chief manufacturing centers are Minneapolis, St. Paul and Duluth. Flour mills, however, are widely distributed throughout the state.

POPULATION. In 1920 Minnesota had a population of 2,387,125, an increase of 311,417 or 15 per cent for the decade. There were 8,809 Negroes and 8,761 Indians. The relatively large number of Indians is due to the location within the state of a number of Indian reservations. The density of population was 29.5 as against 25.7 in 1910. The urban population was 44.1 per cent of the whole as against 41 per cent in 1910. There were 11 cities having 10,000 inhabitants.

EDUCATION. Minnesota has one of the most completely organized school systems in the world, giving an organic connection from the kindergarten to the state university, which is at the head of the system. In 1919 the school law was amended so as to provide for a board of education consisting of five members appointed by the governor. This board appoints a commissioner of education who is at the head of the system and holds office for six years. In each county there is a county superintendent who is at the head of the system for his county. Teachers' colleges are located at Winona, Mankato, St. Cloud, Moorhead, Duluth and Bimidji. These colleges are under the supervision of a special board and devote their entire time to the preparation of teachers for graded and higher schools. During the year 1922, the state expended $56,344,725 upon public education which was an average of $106 per pupil. The state assists local districts in supporting public schools. Appropriations are made by the legislature for special aid to the different classes of schools; high, graded elementary, consolidated and rural schools, maintaining certain standards required by the State Board of Education. In addition to this there is distributed each year the proceeds from a one-mill state tax and the income from the permanent school fund, which fund in 1923 was approximately 31 million dollars. This distribution is made on the basis of the number of pupils in each school district who have attended school a minimum number of days during the year.

The University of Minnesota, which is at the head of the educational system, was provided for by a territorial legislature in 1851 and was opened for instruction at Minneapolis in 1869. It has always been co-educational. The University maintains a graduate school, a college of science, literature and art, a college of engineering and architecture, a department of agriculture, including forestry and home economics, school of law, school of medicine, including a school for nurses, schools of dentistry, farming and mining, and analytical chemistry, in addition to an extension department through which instruction may be given by correspondence. In 1915 the facilities afforded by the Mayo Foundation, established by the Mayo brothers of Rochester, were made available to the university. This placed under the direction of the university all medical instruction in the state. The faculty numbers 950 and the enrollment is approximately 10,000.

Other colleges of importance within the

state, most of which are under denominational control, are Hamline University, St. Paul; Carleton College, Northfield; St. Olaf College, Northfield; Gustavus Adolphus College, St. Peter; Macalester College, St. Paul; St. John's University, Collegeville; St. Thomas' College, St. Paul; College of St. Teresa, Winona; and College of St. Catherine, St. Paul, the last four being under the administration of the Roman Catholic church.

INSTITUTIONS. The charitable and penal institutions are administered by a state board of control appointed by the governor. The most modern methods of discipline and control are in vogue in these institutions and every means is taken to secure the best possible results for the inmates. The hospitals for the insane are located at Anoka, Fergus Falls, Hastings, Rochester and St. Peter; the state public school for dependent children is at Owatonna and a tubercular sanitarium is at Walker; a hospital for crippled and deformed children is at St. Paul and a school for the blind, deaf and feeble-minded is located at Faribault. The state penitentiary is at Stillwater. There is an industrial school for boys at Red Wing and a home school for girls at Sauk Center. Capital punishment in the state was abolished in 1911.

STATE PARKS. The Itasca state park was established in 1891 for the purpose of preserving to the people for all time the region around the head waters of the Mississippi River. Other parks have been added until in 1923 there were fourteen located on tracts of land selected for scenic beauty or historic interest. Among the most important are the Alexander Ramsey state park in Redwood County; Fort Ridgely state park in Nicollet County; Horace Austin state park in Mower County; J. Cook state park in Carleton County; Sibley state park in Kandiyohi County; Toqua Lakes state park in Big Stone County; Whitewater state park in Winona County; Scenic state park in Itasco County and Sleepy Eye Lake state park in Brown County. State forests are maintained in Cass County and St. Louis County and there are also two Federal forest preserves within the state.

GOVERNMENT. The present constitution was adopted in 1857. A majority vote of both houses, as well as a majority of the votes at an election, is necessary to secure a constitutional amendment. The executive department includes the governor, lieutenant-governor, secretary of state, treasurer, auditor and attorney-general all elected for a term of two years except the auditor who is elected for four years. The governor has power to veto special items in appropriation bills and a vote of two-thirds of both houses is necessary to pass a bill over his veto. The legislature consists of two houses, a senate of 67 members, elected for four years, and a house of representatives of 131 members, elected for two years. The legislature meets biennially and the sessions are restricted to 90 legislative days. The judicial department comprises a supreme court of five judges elected for a six year term, district courts, each with one or more judges and a probate court, one for each county. There are also justice courts for the adjudication of petty cases.

HISTORY. The first white man to visit the territory of Minnesota was the Frenchman, DuLhut, who built a fort on the north shore of Lake Superior in 1668. Two years later the missionary, Hennepin, discovered the Falls of St. Anthony, and by 1700 a number of trading posts had been established by the French fur traders. In 1763 the territory in which Minnesota is located was ceded to the English and at the close of the Revolutionary War it was transferred by the English to the United States but full possession was not acquired until 1803 when the United States purchased the Territory of Louisiana from France. The influx of settlers did not begin previously to 1805. The first permanent settlement was the military post at Fort Snelling which was established in 1819. For a time that portion of the state east of the Mississippi was a part of the Territory of Indiana. It was successively transferred to Michigan and Wisconsin but the Indians did not cede their rights to the region until 1838. In 1849 the region had a population of about 5,000 and was organized as the Territory of Minnesota with boundaries extending as far west as the

Missouri River, but only a small section of the southern part was occupied by white settlers. Minnesota was admitted to the Union in 1858 with its present boundaries, but further settlement was prevented by the Sioux outbreak in 1862, in which over 600 white people lost their lives. This so frightened prospective settlers that many found homes in other localities.

After the close of the Civil War immigration increased rapidly and from that time to the present the history of the state has been that of unbroken progress and prosperity.

From 1915 to 1922 the political status of the state was unsettled by the organization and remarkable development of the Working People's Non-Partisan League. The organization of this league was followed by a rapid increase in the membership of labor unions. In 1912 a far-reaching primary law was enacted. This law provides that, with the exception of the state executive officers, the railway and warehouse commissioners and the clerk of the supreme court, all state and local offices, including members of the state legislature shall be nominated and elected on a non-partisan ballot.

During the World War, Minnesota furnished 123,325 men to the various branches of the service and the people subscribed $483,643,000 worth of bonds and war saving stamps and contributed 10 million dollars to war activities.

STATISTICS. The following are the latest statistics available:

Land area, squares miles	80,858
Water area, squares miles	3,824
Forest area, acres	22,000,000
Population (1920)	2,387,125
White	2,368,936
Negro	8,809
Indian	8,761
Foreign born	486,164
Chief cities:	
Minneapolis	380,582
Saint Paul	234,680
Duluth	98,917
Winona	19,143
Hibbing	15,089
Saint Cloud	15,873
Number of counties	86
Members of state senate	67
Members of house of representatives	131
Salary of governor	$7,500
Representatives in Congress	12
Assessed valuation of property	$2,522,066,737
Bonded indebtedness	$20,199,800
Farm area, acres	30,221,758
Improved land, acre	21,481,710
Corn, bushels	140,507,000
Oats, bushels	94,176,000
Wheat, bushels	24,943,000
Barley, bushels	17,720,000
Flax seed, bushels	2,726,000
Potatoes, bushels	27,525,000
Hay, tons	2,924,000
Wool, pounds	3,536,000
Domestic animals:	
Horses	932,794
Milk cows	2,080,469
Other cattle	940,842
Sheep	509,604
Swine	2,380,862
Manufacturing establishments	6,225
Capital invested	$690,386,486
Operatives	115,623
Raw material used	$883,089,777
Output of manufactures	$1,218,129,735
Miles of railway	9,045
Teachers in public schools	19,852
Pupils enrolled	505,107

Minnesota River, a tributary of the upper Mississippi, rises in the eastern slope of the South Dakota foothills, flows south between South Dakota and Minnesota, enters Big Stone Lake, 26 miles long, leaves the lower end of the lake at Ortonville, and flows southeastward to Mankato, 225 miles from Ortonville. At Mankato the Minnesota swings sharply northward, thereafter flowing northeastwardly and uniting with the Mississippi at a point a few miles below the Falls of St. Anthony and between Minneapolis and St. Paul.

The Minnesota drainage basin has an approximate area of 16,600 square miles, and the river is the largest Mississippi affluent in the state of Minnesota. It is 470 miles long, and has for its tributaries the Pomme de Terre, Chippewa, Cottonwood, Lac qui Parle and Blue Earth rivers. For a distance of 45 miles from its mouth the Minnesota is navigable for steamers, and light craft ascend 295 miles at the time of high water.

Minnow, a fresh-water fish caught chiefly for bait. There are a thousand kinds of minnows. Upward of one hundred varieties are known in the northeastern United States. The common minnows are known to fishermen as shiners. They go in schools, and, for fear of large fishes, keep usually to shallow water. Minnows have no food

value. Their place in nature is to serve as food for larger fish. See FISH.

Minorca, second largest in the chain of the Balearic Islands, and the most easterly of them all. It lies twenty miles northeast of Majorca, and has an approximate area of 264 square miles. The northern portion consists of hills, for the most part very arid. The lower part is far more fertile. The surface is generally rough and the coast very rugged. Port Mahon, the capital, has a very fine harbor.

Minorca is rich in minerals, including iron, copper, marble, lead, alabaster and porphyry. It produces oil, wine, hemp, flax, oranges, lemons, cheese, and honey.

Situated as it is in a great body of water, its natives are great navigators, but they are notoriously lazy, and are totally ignorant of modern culture. The ownership of the island has been changed many times in generations past. The Romans, the Carthaginians, the Vandals, the Moors, and finally England held sway over it, only to cede it to Spain in exchange for Gibraltar at the Peace of Amiens in 1802.

Minor Prophets, the name given to a group of twelve books in the Hebrew canon, as distinguished from the Major Prophets, the longer books written by Isaiah, Jeremiah, Ezekiel, and Daniel. The Minor Prophets form the close of the Old Testament in the English Bible. As far back as Augustine, they were employed. The Hebrews named them *The Twelve,* and the Greeks adopted the name. The books included in the collection, are: *Hosea, Amos, Micah, Joel, Obadiah, Jonah, Naham, Habakkak, Zephaniah, Haggai, Zechariah,* and *Malachi.*

Minos, mī′nŏs, the name of two kings of Crete who figure in Greek legend. One was the son of Jupiter and Europa. After his death he was made a judge in the infernal regions. The other Minos, grandson of the first, was celebrated as a lawgiver. He it was for whom Daedalus built the famous labyrinth in which the Minotaur was confined. See MINOTAUR; DAEDALUS.

Minot, N. D., the county seat of Ward County, is on the Mouse River, 200 miles west-northwest of Grand Forks. It is served by the Great Northern and the Minneapolis, St. Paul & Sault Sainte Marie railroads. Minot is the distributing center for an extensive cereal raising district, and its industries include the mining of lignite coal, flour and grist milling, briquette making and founding; power for manufacture is developed from the river.

The city has a large park, through which the river flows, a Federal building, normal school, court house and public library. The commission form of government has been adopted. The 1910 population of Minot was 6,188; this had increased to 10,476 in 1920.

Minotaur, mĭn′ō-taur, in Greek mythology, a monster represented as having the body of a man and the head of a bull. The name means bull of Minos. The bull was confined in the Cretan labyrinth by Minos, king of Crete, and fed on human flesh. Seven youths and seven maidens of Athens were thus sacrificed yearly until Theseus, with the aid of Ariadne, daughter of Minos. succeeded in slaying the monster.

Minstrel, a musician, especially one who sings or recites to the accompaniment of a musical instrument. In the Middle Ages the word minstrel, brought into England by the Normans, was used to designate a musician who devoted himself to the entertainment of the nobility, going from castle to castle singing ballads, often of his own composition, to the music of harp or lute, telling stories, and sometimes accompanying song and story with gesture and mimicry. Sometimes a band of minstrels would travel about together. Again a minstrel would attach himself to the service of a particular lord, following him to war and sharing with him the dangers and honors of whatever exploits he might be engaged upon. The minstrel in the service of a lord was sometimes called a minstrel-squire. The old Anglo-Saxon name for him was scôp, while the wandering minstrel was called a gleeman. The Welsh called their wandering singers bards. The Scandinavians used the word skâlds. The social importance of minstrels gradually declined in England until, in the sixteenth century, they were classed with rogues and vagabonds. See RHAPSODE; BARD; MINNESINGERS; GLEEMEN.

Mint. See CATNIP; PENNYROYAL; PEPPERMINT, etc.

Mint, a place where precious metal is made into coin by public authority. In all civilized countries coining is done by the government in order to protect the people from false material and light weight. When gold and silver were first used for money the pieces were of no particular shape or size. They were taken by weight. About 700 B. C. the Lydians of Asia Minor, who found considerable gold in the sands of their rivers, adopted the plan of stamping pieces with their value to save weighing. So far as known this was the beginning of coinage.

A great many coins of the ancients have been found in ruins and are now preserved in museums. They were evidently made by hand and are very rude affairs. A medieval cut represents four moneymakers at work. The first is melting the precious metal and casting it into ingots. The second is hammering an ingot into a thin sheet. A third, armed with a pair of powerful metal shears, is cutting out round disks, or blanks. A fourth lays the blank on a figured anvil, holds a die on top of it, as one would hold a cold chisel, and hammers away with might and main to impress figures on the two faces.

The United Kingdom has six mints. That at London supplies the home demand and Canada. Branch mints are maintained at Sydney, Melbourne, Calcutta, and Bombay for the convenience of Australia and the East Indies. France has mints at Paris and Bordeaux. The chief mint of the United States, that at Philadelphia, was established in 1792. Others have been established at New Orleans, 1835, San Francisco, 1853, and Denver, 1862.

A modern mint is an extensive establishment requiring the service of expert employes, a large amount of intricate machinery, and delicate apparatus for weighing, but the principal steps in coinage are not difficult to understand.

Gold and silver are purchased in ingots, just as one would buy lead or pig iron. They are taken in over the counter, weighed and receipted for. The ingots are then sent to a testing room to determine their fineness. The seller calls a few days later and receives an order on the public treasury for the value of his ingots. The next step is to rid the ingots of all possible impurities, and to mix them with the right proportion of baser metal, in order to secure the right degree of hardness. Pure gold or pure silver is too soft and wears away too fast for use as money.

Coining, whether of gold or silver, is essentially the same process. The silver bars, for instance, are melted and run into ingots of uniform size. These ingots are run through heavy rollers ten times until reduced to long strips the width and thickness of the coin desired. The strips are then passed through a heavy punching machine that cuts out circular blanks. These blanks are run through a self-acting weighing machine that sorts them into three piles, those that are too light, those that are too heavy, and those that are just right. The light blanks are returned with the perforated strips to the melting room to be made into ingots anew. The heavy blanks are filed slightly on the edge to reduce them to the proper weight. The true blanks are now fed through a tube into a milling machine that presses up the edge of the coin so that it is a little thicker than the center. This is done in order to protect the figures on the coin from wear and also to prevent their sliding off inconveniently when piled up in stacks or rolls on the banker's counter. The blanks with thickened edges are then fed through a heavy stamping machine or press that forces the metal into a round die, which prints the figures on both sides of the coin, as well as flutes the edge, at the rate of eighty silver dollars or 120 silver dimes per minute. Imperfect coins are rejected by a second weighing machine. The perfect coins are counted by being shaken over a frame or tray in which grooves are arranged to catch the coins. When a tray is full, its contents are dumped through a hopper into a canvas bag and sent away for storage. In the case of the more valuable gold coins, the final tests of weight are made by hand, with delicate scales. All workmen who handle the metal wear leather aprons and leather gloves. When these are worn out, they are burned to recover the gold and silver that accumulates in them. Even the sweepings are passed

through fire to recover the gold dust which escapes in the process of coining.

Dies for all the mints are made in the head office at Philadelphia. As our mints are not kept busy at all times they are permitted to coin money for other governments. Money has been coined for the governments of South and Central America.

See COIN; DOLLAR; COUNTERFEITING.

Minute Men, the soldiers of the American Revolution who, in the anxious months before the war broke out, held themselves ready to fight at a minute's notice. It was the minute men who met the British on Lexington Green that eventful April morning of 1775, who fired the "shot heard round the world" at Concord, who flocked swiftly and silently to the British path of retreat until they seemed, as one British officer wrote "to drop from the clouds." Their deadly fire poured into the ranks of the British fleeing madly to Boston, until that goodly company of troops was utterly demoralized. The minute men were in the van at Bunker Hill; they played a prominent part throughout the Revolution. A queer-looking body of men they were, made up of farmers, school teachers who had dropped their books at the sound of battle, half-grown boys, and the like, clad in any garments they happened to own, but they could fight. Longfellow in *Paul Revere's Ride,* describes their fighting at Concord thus:

You know the rest. In the books you have read,
How the British Regulars fired and fled—
How the farmers gave them ball for ball,
From behind each fence and farmyard wall,
Chasing the red-coats down the lane,
Then crossing the fields to emerge again,
Under the trees at the turn of the road,
And only pausing to fire and load.

Miocene, in geology, a term denoting a period of the Tertiary, preceding the Pliocene epoch. It is represented on the Atlantic coast of North America by a stretch of sand and clay, beginning at Martha's Vineyard, but is concealed from there to New Jersey. From that point it extends to Florida and along the Gulf coast into Texas. Marine deposits are also found in some parts of the Pacific coast. The Miocene period was characterized by great eruptions and consequent upheavals, which caused many changes in both hemispheres.

Mir, a Russian peasant community. The rural population of Russia is organized into mirs or villages. The land belongs, not to landholders nor to individuals, but to the mir. The portion set aside for dwellings is occupied permanently. The pasture lands are held in common, each peasant having grazing rights. The cultivated lands are allotted to the several families by vote. Widows and wives whose husbands are away working are entitled to vote. Each mir attends to its own local affairs through officers elected for the purpose. Adjacent mirs are united into volosts. The mir has no voice in outside affairs. Since the abolition of serfdom the nobility and the wealthy have been buying up the lands held heretofore in common by the mir.

Mirabeau, mē-rä-bō′ **Honore Gabriel Riqueti, Count of** (1749-1791), a distinguished leader of the French Revolution. The family won wealth as merchants at Marseilles. The father was a distinguished writer of political articles, a man of advanced thought. The subject of the present sketch was born near Nemours. He appears to have been a dissipated young man who gave his father much trouble. He was imprisoned by his father's orders more than once, and at one time actually lay under sentence of death for having induced a young woman to follow him to Switzerland. His early life was full of intrigue. He appears, however, to have taken an interest in current events. He wrote a number of political pamphlets in which he attacked the existing order of things. In disgrace at home, he fled to Holland, involved himself in many intrigues, then passed to England. He lived for some time in London where he made the acquaintance of various literary people. They had the impression that he was a vain, well informed man, an opponent of injustice and oppression,—a man with high aims, but unscrupulous as to the method by which his end should be attained. He studied the American Revolution and English form of government with interest.

Mirabeau returned to France in time to be elected to the States General, and was present at the opening on May 4, 1789. For two years he played a leading part in

the history of France. He was an able orator, a man of determination. When the French king sent a messenger to direct the separation of the elective members of the States-General from those who held seats by virtue of position, he sent word to the king: "Go and tell your master that we are here by the will of the people, and that no one shall drive us out, except with the bayonet." By holding the assembly together he knew that the royalists could be outvoted.

He hurried the French assembly on from step to step, urging his colleagues not to lose a moment lest the other governments of Europe, foes of liberal ideas, should unite to support the absolute monarchy which the revolutionists of France proposed to overthrow. He urged the adoption of a constitution and the establishment of a constitutional monarchy like that of England. He endeavored to form an alliance with Lafayette, but was repulsed. He was in constant communication with Louis, the king, and won his consent to the adoption of a constitution; but Marie Antoinette, the queen, could not be induced to yield. While making strenuous efforts to bring the French assembly and the Bourbon family of Louis to terms, his health failed. His constitution had been undermined by the dissipations of his youth. He died literally in the harness April 2, 1791.

Mirabeau was not a member of the club of Robespierre, Marat, and Danton. Though a violent, arrogant, unprincipled man, he was in no way connected with the horrors of the Paris guillotine. He died before the king and queen were executed. He was a man of excessive wickedness and unusual ability. Historically, he stood like a giant between the French monarchy and the Paris mob. Like the Girondists, he desired reform, not revolution. At his death there was no force competent to withstand the rage of the populace. Mirabeau dead, all hope of an agreement between France and the reigning family was at an end.

See MARAT; DANTON; FRENCH REVOLUTION.

Miracle Play, or **Mystery,** a form of dramatic composition popular during the latter part of the Middle Ages. These plays had their origin in the offices of religion. It must be remembered that the church services were entirely in Latin, not understood by the congregation, and only the priests were able to read. The clergy, in order to instruct the people, introduced certain scenic representations of events they wished to commemorate or make impressive. For instance, on Good Friday the crucifix might be buried to illustrate the death and burial of the Saviour. On Easter Sunday it would be brought from the tomb with appropriate ceremonies to celebrate the resurrection. Originally those Mysteries, as they were called, were scenes connected with the birth, life, and death of Christ; but gradually other Biblical narratives were represented. The plays became more elaborate. Dialogue and music were introduced. The next step was the "Miracle Play," differing from the Mystery in that it presented scenes from the legends of the saints and the miracles connected with them. The words, Miracle Play and Mystery, have come to be used indiscriminately for either variety of play.

At first, these plays were short. Both authors and actors were ecclesiastics. The scene was represented in the church. Later a scaffolding was erected at the church door and the play was acted upon this. Then the churchyard was chosen for the representation and, as the plays became more and more popular, the village green, and at last the town street, became the place of entertainment.

The first Mystery represented in England was produced about 1110; the last about 1600. During the fourteenth, fifteenth, and a large part of the sixteenth century their popularity was universal. Those presenting Biblical subjects were played in England almost to the exclusion of the Miracles, or those concerned with the lives of saints. It became customary to arrange these plays in a series or cycle, so that the main events from the Creation to Doomsday were enacted. Each large town had its own cycle of plays carefully preserved and acted from year to year. Four cycles, those of York, Chester, Coventry, and Townley, have been preserved. The Townley cycle received its name from Townley Hall in Lancashire. The others are named from

the places where they were performed. The York cycle contains forty-eight plays. The actors were selected frequently from the members of various trades guilds, each guild becoming responsible for the performance of some one play. In some instances an effort seems to have been made, possibly with an appreciation of the humor displayed, to select guilds appropriate to the subjects of the plays. For instance, the ship carpenters played Noah and the building of the ark; the bakers played the Last Supper; the butchers, the Crucifixion. Often the stage or platform was movable, like a great box on wheels. This pageant, as it was called, would stop at given points, when the actors would throw open the doors and perform their parts, each pageant performing one play in the series.

The pageant was in two stories. The lower story was used as a dressing room, its entrance from the upper story being the only part visible to the spectators. This entrance was called "Hell Mouth," and had the form of huge jaws, whence issued fire and smoke from time to time as the action of the play required. Sometimes a third story was added to represent Heaven. The main stage was the world. On it the spectators saw enacted the story of Creation, Adam and Eve in the Garden of Eden, Cain's murder of Abel, The Deluge, stories of Abraham, Isaac, Joseph, Moses, the Slaughter of the Innocents, and all the New Testament stories. The acting was frequently excellent. The stage setting was crude and sometimes absurd. Placards often explained what certain structures were intended to represent. The costumes were as elaborate as funds would permit. The Deity, saints and angels were distinguished by gilt hair, beard, or wings. Often rough pranks and coarse jokes were introduced, the comic element becoming gradually a large part of the performance. Herod, clad in gorgeous robes, left the stage and rode on horseback among the people bragging of his exploits. The Devil would issue from Hell Mouth, as horrible as the skins of beasts, a horn, tail, and cloven hoofs could make him, leap from the stage and play pranks upon the spectators. Sometimes a little real comedy would be introduced. In the *Play of the Shepherds,* while the shepherds are watching their flocks at night, a certain man named Mab appears. The shepherds, knowing him, are suspicious. They put Mab in the center of the circle when they lie down to sleep. When they begin to snore Mab jumps up and steals a sheep. In that time sheep stealing was a crime punishable by death. When Mab reaches home, therefore, with his sheep, his wife is alarmed and hides the sheep in the baby's cradle. The shepherds come to find it, but are warned not to wake the baby. At last the sheep is discovered, Mab is threatened with death, but instead is tossed into the air from a canvas till the shepherds are tired out. It must be borne in mind that these illiterate people were like children. The incongruities did not trouble them. Their imaginations were powerful, if uncultivated, and overlooked the absurdities. They could weep at the Crucifixion and laugh at the Devil's pranks almost in the same breath. Moreover, they were not accustomed to mental effort, and the comic element, absurd and even irreverent as it seems, was necessary to relieve the strain of the more serious performance.

"Moral Plays," or "Moralities," were introduced in the fifteenth century. In these the virtues and vices were personified and the plays represented these powers of good and evil as engaged in a struggle for the soul of man. Such characters as Pride, Gluttony, Temperance, and Good Deeds appear. Everyman in the Castle of Perseverance was a type of man in his earthly life. Naturally enough the Morality Plays were less entertaining than the Mysteries. The Devil was retained, however, to enliven the action; and Vice came to be a prominent figure, acting the part of clown to the Devil. These two, the Devil and Vice, were the great favorites in the days of the Morality Play.

The next step leading inevitably toward the modern drama was the Interlude. This was nothing more nor less than a very short farce, comic, satirical, introducing current events and presented in the intervals of a banquet.

Miracle Plays are still performed in many Roman Catholic countries. The Passion Play performed once in ten years at Ober-Ammergau, Bavaria, is an example

This is purely a religious festival and presents none of the absurdities which characterized the Miracle Play of the fourteenth and fifteenth centuries in England.

See DRAMA; COMEDY.

On the other hand, while the Miracle Plays left no traces of themselves in our serious drama, the play of Punch and Judy looks very like an impoverished descendant of theirs.—Lowell.

Crude as these miracle plays were, enlivened as they were at times by a coarse and incongruous humour, they were the result of an honest effort to make a great theme real and living to simple and ignorant audiences.—Pancoast.

Mirage, mē-razh′, an optical illusion due to the difference in the density of layers of air. It is a well known fact that rays of light falling very obliquely on the surface of a medium of different density do not enter the new medium, but glance off. To an observer standing on the brink of a pool trees on the opposite bank seem to have their doubles under water. The trees that grow downward are seemingly there, because rays of light from the real trees glance from the surface of the water as from a mirror and enter the eye as though they came from the water. In the same way, if the eye of an observer were just beneath the surface of the water, and a fish were to rise toward the surface some distance away, the observer would see not only the fish, but an image of the fish in the air.

The principle of the mirage is to be explained in the same way. In heated countries, as in deserts, the layer of air next the earth becomes exceedingly hot and is rarefied. The border line or border surface between this rarefied layer of air and the heavier air, like the surface of the water, acts like a mirror. Images of distant objects are seen apparently upside down, like the image of the trees in the water. A scientist who accompanied Napoleon's expedition into Egypt states that the French soldiers were astonished by the mirage of the desert. "Villages in the distance appeared to be built upon an island in the middle of a lake. As the observer approached, the boundary of the apparent lake retreated and the village disappeared, while another lake and another village appeared farther on." In like manner, images of objects on the surface of the earth may be seen in the clouds. At certain times the coast of France opposite Dover, ordinarily below the horizon, is seen apparently in an elevated position. The phenomenon is by no means confined to heated regions. As layers of different density produce the mirage it may appear in any latitude. On more than one occasion the writer has seen a mirage in Minnesota on a frosty winter morning. The images were not inverted. The masters of whaling vessels in Arctic waters report that they are not infrequently made aware of the presence of another ship by seeing its inverted image in the sky. Travelers in the Sahara desert, Tartary, and other regions mention the mirage more frequently because, when their need of water is the sorest, they are often tantalized by an apparent pool at no great distance. As they hasten toward it, hoping to slake their thirst, it recedes and fades away. The picture of water is so perfect that it is difficult to believe that it is only the image of a fleck of cloud in an otherwise cloudless sky. It is said that wise old camels, accustomed to the mirage, are never deceived. The Arabs of the Sahara call a mirage "the lake of the gazelles."

Mirror, a polished surface used especially to reflect the face of a person as an aid in making the toilet. The earliest known mirrors were made of metal. The Japanese still manufacture mirrors of this sort. Steel, silver, and a compound of copper were used for the purpose. Several bronze mirrors from ancient Greece, Etruria, and Rome are now preserved in museums of antiquities. One in the British Museum is thought to date from about 500 B. C.

Glass mirrors, composed of polished glass, with a backing of tinfoil or other material, did not became common before the sixteenth century. Prior to that time, small hand mirrors were carried by ladies at their girdles. They consisted of thin, circular plates of polished metal, fixed in a shallow box of gold, silver, enamel, ebony, or other costly material. The box was set often with costly jewels. The making of glass mirrors was a specialty of the Venetians, the original glass workers of Europe. A cylinder of glass was first blown, then

split and laid flat. When it had cooled the edges were beveled and the back was covered with an amalgam. Venetian glass mirrors or looking-glasses soon supplanted those of metal. A Venetian mirror, forty-six by twenty-six inches, in a silver frame, is mentioned as one of the chief treasures of Colbert, Louis XIV's great minister of finance.

The Venetians forbade the citizens to acquaint foreigners with the methods of mirror making under heavy penalty. Nevertheless, in 1665, a colony of Venetian mirror makers was established in Paris. French mirrors have ever since held high rank. Until the middle of the nineteenth century mirrors were made almost universally by causing a sheet of tinfoil to adhere to the back of the glass. Since that time the backing has been formed of a liquid too technical in its makeup for discussion here. Of late, platinum backing, applied by means of a fine brush and precipitation, has grown in favor with the makers of cheap looking-glasses.

In addition to the large number of mirrors imported from France and elsewhere, about $8,000,000 worth are made in the United States annually. There were, in 1900, 103 establishments, employing 2,555 operatives.

Misdemeanor, in common law, an offense which comes below the grade of felony. Small infractions of the law come under the name misdemeanors usually. However, the laws of the different states vary, and what is interpreted as misdemeanor in one state may be construed as felony in another. It is not possible, therefore, to give an exact definition of what constitutes misdemeanor. In some states assault and battery is a misdemeanor, in others objectionable behavior constitutes an offense which is designated as "misbehavior."

In some states there is a provision that on acknowledgment of satisfaction by the injured party in cases like assault and battery the proceeding may be dropped. Misdemeanors are punishable by fine or by imprisonment for a short term, usually from a month to a year, or by both fine and imprisonment.

Mishawaka, Ind., an industrial city of 20,000 population, has a delightful location on the St. Joseph River, four miles east of South Bend, and ninety miles southeast of Chicago. It was founded in 1828, and is one of the oldest cities in northern Indiana. Mishawaka is an Indian name signifying "swift woods rapids."

Water power is developed from the river for use in several of the factories, which produce woolen and rubber footwear, pulleys, hangers, friction clutches, windmills trunks, metal beds and other articles.

Mishawaka is a city of beautiful homes and churches, and is provided with several spacious parks. Within the city, there are eleven modern public and parochial schools buildings, a public library, Federal building and a large home for orphan children.

Transportation is afforded by the New York Central and Grand Trunk railroads also the Chicago, South Bend & Northern Indiana interurban railway.

Missions, Christian, the work of the Christian churches in spreading the religion of Christ among peoples who do not know or have not accepted its teachings. Paul and his fellow apostles were the first great missionaries, and the founders of Christian missions. After them came a long procession of heroic men, who carried the doctrine of the early church into foreign lands with the greatest zeal and devotion. After Luther broke away from the church of Rome, hitherto the only Christian church, Protestant churches founded upon his teachings had all they could do to keep themselves alive for some centuries, so could give but little thought to missions. The Roman Catholic church, however, continued to carry on missionary work as the early church had done and has never ceased to send active missionaries to every part of the world. At this time were organized such societies as the Benedictine, the Franciscan, and the Dominican, the chief purpose of which was missionary. The noble work of the priests among the Indians of North America, as one case, in point, is too well known to need comment. Today Roman Catholic priests are to be found laboring among many heathen peoples.

Protestant missions, as a steady growth,

began with an Englishman, William Carey, who in 1793 left England for forty years' labor among the Hindus of India. Church societies for the promotion of missions were founded one by one among all Protestant denominations, and thousands of men and women have been sent out to the various mission fields. At first the missionaries devoted themselves chiefly to preaching, but as time went on the need for schools, hospitals, and other benefits of civilization became so apparent that such institutions were built side by side with the church, and Christianity was taught also by the doctor, the nurse, and the teacher. Today the term "missions" covers a field of usefulness as broad as civilization itself, for the aim of modern missions is to take to heathen peoples not only the theory, but the actual practice of Christianity. Foremost among the men whose lives have been given to building up the cause of missions were Bishop Patteson, who, after fifteen years of service in the Melanesian Islands, was killed by a shot from a native arrow, Titus Coan, for forty-eight years a pastor in Hawaii, Bishop Thoburn of India, Dr. John Mackenzie, a medical missionary in China, Adoniram Judson, David Livingstone, and Marcus Whitman.

Today the Laymen's Missionary Movement, a national organization of business men, is carrying on a great campaign for missions, its purpose being to raise all the money that is needed to support the cause adequately. Another movement, the Student Volunteer, has bands of students in every important college and university who plan, unless hindered, to go to the foreign field in some missionary capacity, as teachers, perhaps, or engineers, or physicians. Every four years the Student Volunteer Movement holds a great international convention. The sixth such conference was held at Rochester, New York, in 1908. There were over 3,600 delegates at the convention at that time.

Mississippi, "The Bayou State," one of the south-central or Gulf states of the American Union, lying between Alabama on the east and the Mississippi River on the west, which separates it from Arkansas and a portion of Louisiana. It is bounded on the north by Tennessee, on the south by the 30th parallel of North Latitude from the western boundary to the Pearl River, and by the Gulf of Mexico. The distance from Tennessee to the Gulf is 333 miles; the greatest width is 180 miles and the area 46,343 square miles. The gulf coast has a length of 88 miles.

Surface and Drainage. The state is low, the highest land, 602 feet, is in the extreme northern part. A low ridge, or height of land, extends through the state from north to south and separates the rivers flowing into the Gulf of Mexico from those flowing into the Mississippi. The surface is generally level and along the Mississippi and Yazoo rivers the bottom lands are in many places protected by levees. The Yazoo delta, between the Yazoo and Mississippi rivers, has a length of about 175 miles from north to south and an area of 7,000 square miles. This entire region is protected by levees. Occasional bluffs along the Mississippi rise to a height of 100 to 300 feet. The land along the Gulf Coast is low and marshy.

The most important streams flowing into the Mississippi are the Yazoo, formed by the union of the Coldwater and Tallahatchie, the Big Black and the Homochitto. The eastern part of the state is drained by the Tombigbee, the Pascagoula and the Pearl, all flowing directly into the Gulf of Mexico.

Climate. The climate is semi-tropical. The summers are long and hot and the winters mild and pleasant. The intense heat is tempered by breezes from the Gulf and the mean summer temperature is about 80° F, while the winter temperature is 45° F. Occasional frosts occur in the northern part of the state but they seldom appear in the southern part. The average rainfall is 50 inches in the north and 60 inches in the south, and is evenly distributed throughout the year. Because of the pleasant winters, Biloxi, Pass Christian and other towns have become favorite resorts for those who wish to escape the more rigorous winters of the North.

Minerals. The mineral resources of Mississippi are limited. Some coal is found, and limestone, suitable for the manufacture

of hydraulic cement, occurs in the northeastern countries. Gypsum is mined in the central part of the state and phosphate rock and clay are quite generally distributed but the mineral industries are relatively unimportant.

FORESTS. Formerly almost the entire state was covered with forests and now 60 per cent of it is regarded as timberland. In the north hardwood predominates. In the Yazoo valley there are large cypress swamps and long leaf pine characterizes the forests in the south. The state as a whole is noted for its great variety of trees.

AGRICULTURE. Agriculture is the leading industry. In 1920, 61.3 per cent of the land was in farms and over 50 per cent of the farmland was improved. The entire state is covered with a deep fertile soil and that in the bottom lands is exceptional. Soil and climate adapt the state to the growth of all crops suitable to a warm temperate climate. Cotton is the leading crop, followed in point of value by corn and oats. Alfalfa is raised in the northeastern counties and wheat, hay and sweet potatoes are grown in large quantities. Sugar cane is raised on the bottom lands of the south, and this region also produces oranges, figs and other semi-tropical fruits. Mississippi is second only to Texas in its pecans. Stock raising has become an important branch of agriculture and large numbers of high grade cattle and swine are found within the state.

Extensive drainage works have been completed and others are under construction. In 1920 there were over 1,800 miles of open ditches, about 240 miles of tile drains and several accessory levees. These estimates do not include levees and drains of any sort installed by individual farm owners.

MANUFACTURES. The census of 1920 gives the following data for manufactures organized under the factory system:

Number of establishments	2,455
Persons engaged in manufacture	64,452
Primary horse power	200,814
Capital invested	$154,117,337
Cost of material	$96,677,871
Value of products	$197,746,987

The leading manufactured products are lumber, cottonseed oil and cake, cotton goods, turpentine and rosin. The chief industrial centers are Meridian, Jackson, Greenville, Columbus, Laurel, Hattiesburg, Vicksburg and Gulfport.

TRANSPORTATION. The Mississippi River affords water transportation to the western counties. Gulfport has also become an important seaport. The state has about 4,400 miles of railways, the principal lines being the Illinois Central, the Yazoo & Mississippi Valley, the Mobile & Ohio, the New Orleans, Mobile & Chicago and the Southern, Mississippi Central, and the Frisco. These systems, with their branches provide excellent railway transportation for the entire state.

POPULATION. In 1920 the population was 1,790,618, which was a decrease of .4 per cent from the population of 1910. About 50 per cent of the inhabitants are colored. The urban population was 13.4 per cent in 1920 as against 11.5 per cent in 1910. The density was 38.6 per square mile as against 38.8 in 1910. There were six cities having a population of over 12,000.

EDUCATION. Education has made rapid advancement since 1910. Schools are supported by a permanent school fund, annual appropriations by the legislature, local taxes and a poll tax. The school system is in charge of a board of education consisting of the secretary of state, the attorney-general and the superintendent of public instruction, who is the executive officer and chairman of the board. The schools of each county are in charge of a county superintendent. In 1908 provision was made for establishing agricultural high schools in each county, one for whites and one for colored pupils, or giving two counties the opportunity to combine in the establishment of such schools. These schools are supported by local taxation and by state and federal aid. Their establishment was one of the most important steps in the advancement of public education. The University of Mississippi at Oxford, the Agricultural and Mechanical College at Starkville, Mississippi State College for Women, and the normal school at Hattiesburg, are state institutions. Other schools of importance include the Mississippi College, at Clinton, Millsaps College, at Jackson, Meridian College, at Meridian, Tougaloo University, near Jackson, Alcorn Agricul-

tural and Mechanical College at Westside, the last three being institutions for higher education for Negroes. There are numerous other schools, in the charge of various religious denominations.

The University of Mississippi, at Oxford, was opened in 1848 but was compelled to suspend during the Civil War. It provides undergraduate courses in arts, sciences, education, philosophy, mining, civil and electrical engineering, and maintains schools of law and medicine and a summer school. The university is at the head of the school system and is affiliated with the high schools of the state. The faculty numbers 45 and the enrollment is about 700.

Institutions. The school for the deaf dumb and the school for the blind are at Jackson. The school for the feebleminded is at Ellisville, and the industrial school for neglected boys and girls is at Columbia. Hospitals for the insane are located at Jackson and Meridian, and there are state hospitals at Jackson, Natchez, Vicksburg and several other places. There are several prison farms controlled by a board of trustees.

Government. The present constitution was adopted in 1890 and it is the fourth since the state was admitted to the Union. In 1916 the initiative and referendum were adopted by constitutional amendment and later declared invalid. A literacy or educational test for voting has greatly reduced the Negro vote.

The executive department consists of the governor, lieutenant-governor, secretary of state, treasurer, auditor, attorney-general, state superintendent of education, revenue agent, insurance commissioner and commissioner of agriculture, all elected for four years.

The legislative power is vested in a senate of 45 members and a house of representatives of 138 members, all elected for four years. Sessions are held in the even number of years beginning in January.

The judicial department comprises a supreme court of six members, elected by the people for eight years, a chancery court in each county and a circuit court presided over by judges elected by the people. There are also district courts and courts of justices of the peace. Married women have the same rights as their husbands in holding and selling property or the making of contracts.

History. Before the advent of white men the region was occupied by three powerful Indian tribes, the Chickasaw, in the north, the Choctaw, in the center and the Natchez, in the southwest. De Soto was the first white man to enter the territory, which he crossed in 1541. In 1682 La Salle took possession of the region in the name of France, including it in Louisiana. The first settlement was made at Biloxi by the French in 1699; the second was made at Fort Rosalie, now Natchez, in 1716. By the Treaty of Paris, in 1763, the territory was ceded to Great Britain, and soon after this English and Scotch colonists began to form settlements. In 1781 the southern part, known as West Florida, was ceded to Spain. The Treaty of Paris, in 1783, which closed the Revolutionary War, placed the northern boundary of West Florida at the 31st parallel N. Latitude. This led to a prolonged dispute between Spain and the United States. In 1798 the territory of Mississippi was organized. Mississippi was admitted as a state in December 1821, forming the twentieth state in the Union. The capital, Jackson, was founded the same year. Mississippi adopted the ordinance of secession January 9, 1861. During the continuance of the Civil War numerous important battles occurred in Mississippi, notably those of Shiloh, Corinth and Vicksburg. In 1870 the state was readmitted to the Union. Owing to the devastation of the Civil War its recovery was at first slow, but since 1890 its progress has been rapid.

During the World War Mississippi supplied over 52,000 men to the army and over 4,000 men to the navy.

Statistics. The following statistics are the latest to be had from trustworthy sources:

Land area, square miles	46,362
Water area, squares miles	503
Forest area	17,000,000
Population (1920)	1,790,618
White	853,918
Negro	936,700

Chief cities:	
Meridian	23,399
Jackson	22,817
Vicksburg	18,072
Hattiesburg	13,270
Number of counties	79
Members of state senate	45
Members of house of representatives	138
Salary of governor	$5,000
Representatives in Congress	10
Assessed valuation of property	$649,644,340
Bonded indebtedness	$8,443,254
Farm area, acres	18,253,579
Improved land	9,325,677
Cotton, bales (500 lbs.)	870,000
Corn, bushels	57,096,000
Sweet potatoes, bushels	8,560,000
Potatoes, bushels	1,088,000
Wheat, bushels	84,000
Oats, bushels	2,940,000
Wool, pounds	500,000
Domestic animals:	
Horses	256,000
Mules	312,000
Milk cows	517,000
Other cattle	680,000
Sheep	149,000
Swine	1,783,000
Manufacturing establishments	2,455
Capital invested	$154,117,337
Operatives	64,452
Raw material used	$96,677,871
Output of manufactures	$197,746,987
Miles of railway	4,447
Teachers in public schools	12,652

Mississippi Bubble. See LAW, JOHN.

Mississippi River, the largest river of North America. The Indian name, *Michi Sepe,* means "The Great River." It is also translated to mean "The Father of Waters." The Mississippi rises in Lake Itasca, Minnesota, at an elevation of 1,575 feet above the sea level. At its source it is a stream of clear water, twenty feet in width, and perhaps a foot in depth, a mere brook. Its general course is southward. For the first 175 miles to Pokegama Dam, the fall is but 150 feet. The first tributary usually shown on the map is the Minnesota. The Mississippi's principal tributaries, however, are the Ohio, the Missouri, the Arkansas, and the Red. Its waters remain comparatively clear until they are joined by the turbulent yellow flood of the Missouri. At New Orleans, the Mississippi is 3,100 ft. wide and 60 ft. deep. One-third of the river water of the United States passes New Orleans. The volume is sufficient to cover forty acres twenty-one feet deep each minute.

Missoula, Mont., the county seat of Missoula County, is situated on the Missoula River, and on the Northern Pacific and the Chicago, Milwaukee & St. Paul railroads, 125 miles west by north of Helena. It is the outlet for the live stock and farm produce of the Bitter Root Valley, a region made productive through irrigation. Power generated by the Big Blackfoot River, seven miles distant, is transmitted to the city by cable. Missoula is an important lumbering city, her mills employing annually more than a thousand men. There are also flour mills, a sash and door factory and brick and tile works and other industries.

The city is the seat of the University of Montana, and has a Catholic academy, a fine high school, a public library and the Missoula Business and Normal College. In 1920 the population was 12,668.

Missouri, one of the west-central states, situated midway between the Atlantic Ocean and the Rocky Mountains and likewise midway between Canada and the Gulf of Mexico. It is bounded on the north by Iowa; on the east by the Mississippi River, which separates it from Illinois, Kentucky and Tennessee; on the south by Arkansas; on the west by Oklahoma, Kansas and Nebraska. The Missouri River forms the northern half of the western boundary. Its area is 69,420 square miles, of which 693 square miles are water surface. Its extreme altitude is 1,800 feet. It has 1,000 miles of navigable waterways and a frontage on the Mississippi River of 500 miles.

SURFACE AND DRAINAGE. The region north of the Missouri River and in west central area is generally rolling upland, largely prairie but more broken than the plains of Iowa and Illinois. South of the Osage River the surface gradually rises to meet the slope of the Ozark Plateau. The Ozark and St. Francois Mountains cross the southern part of the state from east to west and form one of the most delightful scenic regions of the Mississippi Valley. Missouri is celebrated for its wonderful caves, some of which are the most beautiful and remarkable in the world. Ha-Ha-Tonka in Camden County

possesses great scenic beauty and classic variety of rural grandeur. The Missouri River forms the northern part of the western boundary and crosses the state from east to west a little north of the center. It is the principal stream within the state and with its tributaries, the Grand from the north and the Osage and Gasconade from the south, drains fully one-half of the area of the state. The northeast section is drained by the Wyaconda and the Salt. The Meramec flows into the Mississippi south of the Missouri, and the St. Francois, the Black and the Current drain the southeastern part of the state. Missouri has no large lakes.

Climate. Missouri is subject to extremes of heat and cold. It is too far inland to be affected by the Great Lakes and there are no mountains to shelter the prairies from the cold winds of the north in the winter or the hot winds of the south in the summer. But the Ozark Mountains afford relief from the intensive heat during the summer months. The winters are mild and even in the north the temperature seldom falls below zero. The mean temperature of the state is 33° for the winter and 77° for the summer. The annual rainfall is 35 inches in the north and 50 inches in the south and is abundant for all agricultural purposes.

Minerals. Missouri has extensive mineral resources. The coal measures underlie 25,000 square miles of Missouri land in many counties, varying in thickness from 18 inches to 5 feet. The mines employ about 10,000 men and the annual output of coal exceeds 3,350,000 long tons. There are remarkable deposits of cannel-coal, pockets varying in thickness from 5 to 80 feet. Coal mining is the third mineral industry. Missouri leads all states in the production of zinc, lead, tripoli and baryta. The principal lead and zinc mines are in the central, and the southeastern and southwestern parts of the state. Missouri has the first lead works ever opened in America, and the largest lead producing factory in the world. The combined value of the annual zinc and lead output exceeds $25,000,000. Large quantities of Portland Cement are also produced. In the Ozark regions are extensive deposits of iron ore. Pilot Knob and Iron Mountain are considered among the most valuable deposits of this sort in the country. These ores are awaiting development. The first Missouri industry was lead mining, which was begun by the French about 1719 in Fredericktown in Madison county. The state ranks high in lime and limestone resources. In Missouri are great deposits of clay, excellent for high grade chinaware and pottery. The first commercial quality of glass sand is found in large quantities in a narrow belt extending from Calloway to Cape Girardeau County.

Forests. For some years the value of lumber products of the state has exceeded $14,000,000. Over 40 per cent of the state is timber land. The most valuable forests are in the Ozark region where the hardwoods constitute an extensive source of lumber. Cedar is found in the eastern part of the state and cypress swamps occur along the rivers in the southeast.

Agriculture. A great variety of climate and soil gives Missouri a wide range of agricultural products, and it is America's first state in diversified agriculture. Cereals are grown chiefly in the north and northwestern sections and constitute the principal crop. Corn leads with an average production of about 190,000,000 bushels. This is followed by wheat, which in 1926 amounted to about 37,000,000 bushels. Oats ranked third with an average production of 35,000,000 bushels. Hay, potatoes, sorghum, rye and tobacco are important crops. Cotton is raised in the southeastern part of the state; the acreage is about 350,000 and the yield about 6,500 tons. Missouri is one of the leading states in the Union in the production of apples. Peaches and all other northern fruits, such as pears and plums, also flourish. In the southern part of the state, nectarines, apricots and other semi-tropical fruits are successfully grown. In some sections small fruits are a specialty and Missouri produces more blackberries than any other state in the Union. The central prairies produce an abundance of blue grass, timothy and for-

age crops. This is conducive to the raising of high-grade live stock. Missouri is one of the foremost stock raising states and produces cattle and swine in large numbers. Some sheep are raised in the south. Missouri has at its State University the largest and best known college herd of Jersey cattle in the world from the standpoint of butter production. In 1920, 79 per cent of the total area of the state was in farm lands and 71 per cent of these lands was improved. The average size of a farm was 132.2 acres. There are 263,004 farms in Missouri. Out of this number 185,000 are operated by owners, 75,727 are rented farms, and 2,247 farms are operated by managers; 70 per cent of Missouri's farms are operated by their owners. The first United States Secretary of Agriculture, Norman I. Coleman, was a Missourian. The agricultural institutions are the State Fair at Sedalia, and the Fruit Experiment Station at Mountain Grove.

MANUFACTURES. The leading manufactures in the order of their importance include slaughtering and meat-packing, boots and shoes, flour and other grist mill products, tobacco, lumber, men's clothing, and railroad cars. The great manufacturing centers are St. Louis and Kansas City while the meat-packing industry is centered at St. Joseph. Missouri is the only state with three great live stock markets and well known packing centers, St. Louis, Kansas City and St. Joseph.

TRANSPORTATION. River transportation is furnished by the Mississippi and Missouri rivers, both being navigable everywhere they touch the state. There are over 8,000 miles of railway, including the Missouri Pacific; the Atchison, Topeka and Santa Fe; St. Louis and San Francisco; Chicago, Burlington and Quincy; Chicago and Alton; Wabash; Missouri, Kansas and Texas, and a number of other lines. The great systems with their branches furnish ample railway facilities for nearly all parts of the state. There are about 1,200 miles of electric lines connecting the large cities with towns near by. In 1920 a $60,000,000 bond issue was voted for better roads. The total mileage of the road system is 7,640 miles. At the close of the year 1926 Missouri had 4,936 miles of hard-surface roads and 2,649 miles of graded earth roads. The total cost was $99,527,722.

POPULATION. In 1926 Missouri had 3,498,143 inhabitants, an increase of 94,088 since 1920. The urban population in 1920 was 46.6 per cent as against 42.5 per cent in 1910. The three largest cities, St. Louis, Kansas City, and St. Joseph, include 34.5 per cent of the urban population.

EDUCATION. One-third of the public revenue is devoted to the support of the public schools. In 1926 this appropriation amounted to about $3,365,000. This fund is supplemented annually by the interest on the common school fund which amounts to about $187,000. The annual expenditures for public education exceeds $52,000,000. The state funds are apportioned on the basis of the number of teachers and attendance, and additional aid is given to certain rural schools and high schools. Compulsory attendance is required by law of all children between the ages of seven and fourteen years. For the year 1926 Missouri spent for vocational education $585,000, Teacher-training $350,000, instruction for defectives $85,000. The state superintendent of public schools is in charge of the system and a county superintendent has charge of the schools in each county. The state board of education is composed of the state superintendent of public schools, the governor, secretary of state and attorney general. Under this system Missouri has provided an excellent public school system.

UNIVERSITY OF MISSOURI. The University of Missouri, which is at the head of the educational system, is located at Columbia, about half way between St. Louis and Kansas City, about the center of the state. It was founded in 1839. It is reached by the Wabash and the Missouri, Kansas and Texas Railroads. State highways No. 50 and No. 63 pass through Columbia. The university now maintains colleges of arts and sciences, a college of agriculture, schools of commerce, education, engineering, journalism, medicine, fine arts, graduate school and extension service. The

university grounds at Columbia cover more than 800 acres. It maintains an 80-acre tract for experimental work and agriculture, and a 90-acre tract where a plant is operated for the manufacture of hog cholera serum. The university also owns about 46,000 acres mainly in the Ozark Mountains of southern Missouri. A school of mines and metallurgy is located at Rolla on a campus of 70 acres. The library at Columbia contains 231,000 volumes, 25,000 pamphlets, and 2,942 periodicals are currently received at the university. Missouri has the first state school of journalism ever organized, founded by Walter Williams of the State University at Columbia. The university is co-educational, women being first admitted in 1869. The faculty numbers 300 and the enrollment is approximately 6,500.

COLLEGES. The state teachers' colleges are maintained at Maryville, Kirksville, Warrensburg, Springfield and Cape Girardeau.

Lincoln University at Jefferson City is maintained for the education of colored people.

Other important educational institutions in the state include Washington University at St. Louis, William Jewell College at Liberty, Westminster College at Fulton, Central College at Fayette, Drury College at Springfield, Missouri Valley College at Marshall, St. Louis University at St. Louis, Park College at Parkville, Central Wesleyan College at Warrenton, Missouri Wesleyan College at Cameron, Culver-Stockton College at Canton, Lindenwood College at St. Charles, and numerous other institutions under the auspices of various religious denominations.

INSTITUTIONS. The penal and charitable institutions are under the control of a state board. The penal institution is the Penitentiary at Jefferson City. The charitable institutions are the school for the deaf at Fulton, the school for the blind at St. Louis, and the school home for children at Carrollton where neglected and dependent children are furnished a temporary home and proper care and instruction. The four institutions for the insane are located at Fulton, St. Joseph, Nevada and Farmington. The Missouri Sanitarium at Mt. Vernon for the treatment of tuberculosis in its early stages, and the colony for the feeble-minded at Marshall where feeble-minded and harmless epileptics may receive proper care deserve mention. The Federal Soldiers' home is at St. James, the Confederate Home at Higginsville, the Missouri reformatory for boys at Boonville, the Industrial Home for girls at Chillicothe, and the Industrial Home for negro girls at Tipton.

GOVERNMENT. The present constitution was adopted in 1875. The executive department consists of a governor, lieutenant-governor, secretary of state, state auditor, attorney general and superintendent of public schools, all of whom are elected for four years. The governor and treasurer are not eligible for re-election. The legislative department consists of a house of representatives of 150 members, chosen every two years, and a senate of 34 members elected for four years. The judicial department includes a supreme court, court of appeals, circuit court and inferior courts. All judges are elected by the people. Juvenile courts have been established in all counties.

HISTORY. De Soto explored northern Arkansas and possibly, even probably, entered southeastern Missouri in 1541. Marquette and Joliet made their trip down the Mississippi river, which flows along the eastern border of Missouri, in 1673. It is probable that they touched the state and certainly they viewed Missouri's soil. When La Salle took possession of the Mississippi valley in 1682 he was at the mouth of the Mississippi, having floated down that stream. The French made a settlement in Missouri at the mouth of the des Peres river near St. Louis at the opening of the 18th century, about 1700. The first permanent settlement in Missouri was at Ste. Genevieve around 1735. St. Louis was founded by Pierre Laclede Liguest and Auguste Chouteau in 1764. The French territory lying west of the Mississippi was ceded to Spain by the secret treaty of Fontainebleau on December 3, 1762. The

1. Coal
2. Wheat
3. Corn
4. Rye
5. Mules
6. State Flower
7. Cotton
8. Tobacco
9. Buckwheat
10. Potatoes
11. Iron
12. Lead
13. Zinc
14. Lumber
15. Clover
16. Cattle
17. Hogs
18. 19. Fruits and Vegetables

United States purchased Louisiana in 1803 but the formal transfer of the upper part, in which Missouri was included, did not take place until 1804. The first State Legislature met in St. Louis in 1820. The temporary capital of Missouri was at St. Charles from 1821-1826, after which date Jefferson City became the permanent capital. Missouri has one of the three finest capitol buildings in the United States. It was erected at a cost of $4,215,000. It is constructed of Burlington limestone from Carthage and Phenix, Missouri. The architecture of the capitol is pronounced by the best judges as unsurpassed by any public building in the country. It was officially dedicated Monday, October 6, 1924, before an audience of more than 20,000 people. Although the people of the state were divided on the question of slavery and secession in 1861, a majority favored the Union, to which they contributed 110,000 soldiers. The contribution to the Confederacy is not definitely known but was at least 30,000 and may have been as high as 40,000 or 50,000. Missouri furnished 156,232 men for military and naval service during the World War.

The State Historical Society is located at Columbia. It has a collection of 65,000 volumes and pamphlets housed in the general library building of the university.

A law has been enacted recognizing the hawthorn as the official flower of Missouri. The haw grows profusely in all sections of Missouri. A law has been enacted establishing an official state flag. It is rectangular in shape, with one red, one white and one blue horizontal stripe of equal length and width. The red stripe is at the top and the blue at the bottom. In the center of the flag is located the coat of arms in the official colors.

Missouri furnished four distinguished men in the World War: General John J. Pershing, Commander-in-Chief of the largest army that ever followed the Stars and Stripes; Major General Enoch H. Crowder, author and executive of the Selective Service Act; Admiral R. E. Coontz, Commander of the American Navy; and Brigadier General Edward Russell, Chief Signal Officer in France during the World War.

Statistics

The following are the latest reliable statistics available:

Land area, square miles	68,727
Water area, square miles	693
Forest area, acres	15,500,000
Population (1926)	3,498,143
White	3,225,814
Negro	178,241
Foreign born	186,026
Chief cities:	
St. Louis	772,897
Kansas City	324,410
St. Joseph	77,939
Springfield	39,631
Joplin	29,902
Sedalia	21,144
Hannibal	19,306
Number of counties	114
Members of state senate	34
Members of house of representatives	150
Salary of governor	$5,000
Representatives in Congress	18
Assessed valuation of property	$4,248,238,684
Bonded indebtedness	$5,598,839
Farm area, acres	34,774,679
Improved land, acres (1926)	24,832,966
Corn, bushels	174,189,000
Oats, bushels	41,540,000
Wheat, bushels	21,474,000
Potatoes, bushels	6,480,000
Flax seed, bushels	16,000
Tobacco, pounds	4,750,000
Cotton, bales (500 lbs.)	255,000
Hay, tons	3,686,000
Rice, bushels	610,000
Sweet potatoes, bushels	1,120,000
Barley, bushels	216,000
Buckwheat, bushels	15,000
Domestic animals:	
Horses	861,000
Mules	369,000
Dairy cattle	793,000
Beef cattle	2,063,000
Sheep	1,205,000
Swine	4,463,000
Fruits:	
Apples, farm crop, bushels	5,015,000
Apples, commercial crop, barrels	619,000
Strawberries, quarts	23,232,000
Peaches, bushels	1,722,000
Pears, bushels	473,000
Manufacturing establishments	5,292
Capital invested	$939,691,255
Operatives	196,693
Raw material used	$1,059,597,484
Output of manufactures	$1,599,313,123
Coal, tons	5,133,929
Miles of railway	8,193
Teachers in public schools	23,222
Pupils enrolled	761,923

Missouri Compromise, in American history an arrangement between the slave states and the free states embodied principally in an act of Congress approved March 6, 1820. It provided for the admission of Missouri into the Union with a constitution permitting slavery but it specifically prohibited slavery in the entire remainder of the Louisiana Territory, lying north of 36° 30′ latitude, that being the southern boundary of Missouri.

In February 1819 James W. Tallmadge of New York introduced into the Congressional debate on the subject of Missouri's admission an amendment to the effect, "That further introduction of slavery or involuntary servitude be prohibited and that all children of slaves born within the state after its admission into the Union shall be free at the age of twenty-five." Alabama was admitted into the Union that year without any prohibition against slavery, thus making the number of free states and slave states equal. To admit Missouri as either slave or free would destroy the equilibrium. The bill with the Tallmadge amendment passed the House February 7, 1819, with a majority of eleven votes, and on March 2 the Senate passed the bill but without the amendment. The adjournment of Congress two days later left the matter unsettled until December, 1819, when another bill for the admission of Missouri was introduced. John W. Taylor of New York offered an amendment January 26, 1820, providing that as a condition for the admission of Missouri to the Union Missouri should be required to adopt a constitution forever making it a free state. This opened up the entire question of the right of the Federal Government to dictate conditions of admission to the Union. The slave-holding states, as might have been expected, adopted the view that Congress had no right to impose such conditions.

Meanwhile the situation was complicated by the application of Maine for admission to the Union as a free state. The friends of slavery for Missouri promptly took heart and coupled the bill for the admission of Missouri with that for the admission of Maine and because they constituted the majority in the Senate that body steadfastly refused to disconnect the two measures. In this condition the essentials of the ultimate compromise were proposed by Senator Thomas of Illinois in an amendment which provided that Missouri should be admitted with slavery allowed, but that all the rest of the Louisiana Territory north of 36° 30′ should be forever free. The bill as thus amended passed the Senate February 18, 1820, by a vote of 34 to 10. The House refused to agree to the combination of Missouri and Maine in the same bill and the matter went into conference committee. This committee recommended that Maine be accepted separately and that Missouri be admitted with the Thomas amendment. Henry Clay as Speaker of the House used his strong influence to bring about the compromise effected. At the following session of Congress the constitution of Missouri was presented to Congress for approval. It included a paragraph requiring the Legislature to prevent the immigration of free negroes into the state. This provoked much discussion as to the duty of the Federal Government to protect all its citizens in their civil rights. After protracted discussion and negotiation a bill was finally introduced providing that Missouri should be admitted only after its Legislature had declared that no law would ever be passed and no construction upon any existing law would be permitted abridging the rights guaranteed to all citizens by the Federal Government. The bill involving this second compromise was approved March 2, 1821.

The Missouri compromise was specifically repealed by the Kansas-Nebraskà bill of 1854 and was pronounced unconstitutional and void by the famous Dred Scott Decision.

See John Brown; Dred Scott.

Missouri River, the chief tributary of the Mississippi. It is formed by the Jefferson, the Madison, and the Gallatin. They rise in the Yellowstone Park region. It executes a wide sweep through northern Montana; then turns southeastward through North and South Dakota. It separates Nebraska and Iowa, grazes the north-

western corner of Kansas, flows eastward through central Missouri into the Mississippi just above St. Louis. The length from the source of the Jefferson to the Mississippi is 3,000 miles. Including the lower Mississippi the total length is 4,200 miles, the longest water course in the world.

It is navigable for flat-bottomed steamboats as far as Fort Buford, at the mouth of the Yellowstone. In high water boats reach Great Falls. The upper part of the river is a foaming mountain torrent. At one point it passes through the "Gate of the Rocky Mountains," a narrow gorge about six miles long, with perpendicular walls 1,200 feet high. At Great Falls, Montana, the river descends in a series of leaps. The highest fall is eighty-seven feet. The total descent in sixteen miles is 350 feet. The principal tributaries of the Missouri are the Yellowstone, the Platte, and the Kansas. The total area drained is 500,000 square miles, not far from two-fifths of the entire Mississippi basin.

The Missouri carries an immense amount of yellow silt, gaining for it the name of the "Big Muddy." This silt is constantly settling into mud banks, which are again scoured away most unexpectedly. The steamer channel shifts from week to week most unaccountably, rendering the river exasperatingly dangerous and difficult of navigation. The volume of water varies greatly. At one time the river is "on a tear." Its alluvial banks melt away in the flood like magic. In a few weeks the water has gone down and the river channel is a vast series of half exposed mud flats. By many the Missouri is held to be the main stream, but the comparatively constant volume of water in the Mississippi and the continuous direction of its valley are sound arguments for considering the Missouri a tributary stream.

The chief cities on the Missouri are Great Falls and Fort Benton, Montana; Mandan and Bismarck in North Dakota; Pierre and Yankton in South Dakota; Sioux City and Council Bluffs in Iowa; Omaha in Nebraska; Atchison, Leavenworth, and Kansas City, Kansas; Kansas City, St. Joseph, and Jefferson City, Missouri.

Mistletoe, mĭz″l-tō, small shrubs, parasitic on the branches of trees. The common mistletoe of England has opposite, fleshy, pale evergreen leaves, and currant-like white berries. It grows chiefly on orchard trees and forest trees, and, contrary to popular belief, seldom on the oak. In Brittany and Normandy the mistletoe saps the strength of the apple trees. It is gathered in quantity for the London market. Mistletoe is a traditional Christmas decoration held in respect and favor from the time of the Druids. Scott, in describing preparations for Christmas festivities, says:

> Forth to the wood did merrymen go
> To gather in the mistletoe.

The American mistletoe is a different, but similar plant growing on deciduous trees, especially the tupelo, poplar, and red maple, from New Jersey, southern Indiana, and east Kansas to the Gulf. Our Eastern cities import English mistletoe. It is brought over by express. The West is more dependent on Southern mistletoe. It must be shipped with as much care as apples to prevent loss by freezing. Six species known as mistletoes are found on the Pacific coast from Vancouver southward.

There is an old tradition, long current in England, that the mistletoe was once a fair tree in the forest; that from its wood was made the cross upon which Christ was crucified. In consequence of its having been put to such a use the mistletoe was cursed and thenceforth lived as an insignificant plant. In Scandinavian legend the arrow that slew Baldur was made from the mistletoe, but at the time it was no tree, but so small a plant that Baldur's mother thought it unnecessary to take an oath from it when she made all things swear not to hurt Baldur. It is impossible to determine whether the English legend that the cross was of mistletoe had its origin in the old tale of Baldur or whether the use of the mistletoe in the Scandinavian story grew out of the other legend. The latter is perhaps more probable, as the mistletoe does not grow in Iceland and only in a few places in Norway, while it is a common plant in England. Bird lime is prepared from its fruit.

> The mistletoe hung in the castle hall,
> The holly-branch shone on the old oak wall.
> —Bayly, *The Mistletoe Bough.*

Mitchell, Donald Grant (1822-1908), American author who wrote under the pseudonym of Ik Marvel. He was born at Norwich, Connecticut, and received his education at Yale University. Later he studied law. He was United States consul to Venice in 1853. In 1855 Mitchell settled on his farm, "Edgewood," near New Haven, where he has spent his time largely in writing on various themes. *Reveries of a Bachelor, Dream Life, Dr. Johns, My Farm at Edgewood, Wet Days at Edgewood, Out of Town Places, American Lands and Letters,* are among his well known books. Mitchell's style is easy and pleasant, the old-fashioned sentiment and quaint humor reminding one a little of Irving.

Mitchell, John (1870-1919), an American labor leader, for ten years president of the United Mine Workers of America. He was born at Braidwood, Illinois. When only thirteen he went to work in the mines of his home town, but by constant reading and studying he gained an education that fitted him for leadership later in life. In 1897 he became a national organizer of the United States Mine Workers, in 1898 its vice-president. and in 1899 its president. He had been made vice-president of the American Federation of Labor, of which the United Mine Workers is a part, in 1898. Until 1907, when he was compelled to resign by a serious illness, he performed his difficult duties as leader of 375,000 restless miners with the greatest wisdom and firmness. In the great Pennsylvania miners' strike of 1902, he won for the anthracite workers an increase in wages of twenty-four per cent. At one time during this strike President Roosevelt called a conference of the leading agitators. He said afterward that "the operators were intolerable, he himself was out of temper, and John Mitchell was the only gentleman in the room." Mr. Mitchell has written numerous magazine articles on labor.

Mitchell, Maria (1818-1889), an American astronomer. She was born at Nantucket, Massachusetts, the daughter of William Mitchell, who was himself an astronomer. She was for a time a teacher in a private school, and was for twenty years librarian of the Nantucket Athenaeum. She became known as an astronomer in 1847 by the discovery of a new comet. She continued her astronomical studies and in 1865 was made professor of astronomy at Vassar College. She received the degree of LL. D. from Dartmouth in 1852 and from Columbia in 1887, and was the first woman honored by election to the American Academy of Arts and Sciences. She was interested during her later years in raising a fund to endow the chair of astronomy at Vassar. The fund was completed after her death, and was called in her honor the Maria Mitchell Endowment Fund.

Mitchell, Silas Weir (1829-1914), an American physician and author. He was born at Philadelphia. He received his education at the University of Pennsylvania and at Jefferson Medical College. He was the author of many medical treatises of scientific importance. Outside of his profession he was known widely as a novelist. *Hugh Wynne* and the *Adventures of François* and his most popular stories. Others are *Roland Blake, Far in the Forest,* and *Circumstance.* Mitchell was also the author of several volumes of poetry.

Mitchell, South Dakota, the county seat of Davidson County, is situated on the James River and on the Chicago, Milwaukee & St. Paul and Minneapolis, St. Paul & Omaha railroads. It is the shipping center of an extensive agricultural region, the principal products being corn and hogs. There were handled in Mitchell in 1922, 14,166 carloads of hogs. Since 1893 Mitchell has been the scene of an annual Fall Festival, the chief feature being a Corn Palace, the only one in existence. Original cost $275,000; capacity, 5,000. It is redecorated annually at a cost of $10,000 in corn, grain and grasses. The most marvelous exhibit of nature's wonderful colors blended into works of art by skilled decorators. Mitchell is a division point of the Chicago, Milwaukee & St. Paul Railroad and has large railroad shops, elevators, creameries, cigar and candy factories. It also has state Catholic and state Methodist hospitals, the South Dakota Highway supply depot, a Carnegie library, a large Federal building and exceptionally good public schools. Mitchell is on the

Custer Battlefield Highway, George Washington Highway and the Sunshine Highway. In 1920 the population was 8478.

Mite, a small coin once circulating in England. The translators of the Bible gave the name to a corresponding coin of Palestine. The widow's "two mites," which she of her poverty cast into the box, and which Christ declared, Luke xxi: 2, outweighed all the gifts of the rich, were together worth about half a cent. See COIN.

Mite, an order of insect-like animals including ticks, itch mites, and "red spiders." The thorax and the abdomen are fused into one body and the head is distinct. The adult mite has four pairs of legs. The itch-mite burrows, especially between the toes and fingers of those whom it afflicts, but readily succumbs to sulphur or mercurial ointment. Many other mites are parasitic. The cattle tick of the Southern States is a large mite. The wood-tick is also a mite. The large sheep-tick is not a mite but an abnormal, wingless, parasitic fly. A mite that infests house plants is popularly called the red spider. Certain other mites, as the pear mite, take up their residence in the leaves of trees, causing ruinous blisters. Scavenger mites infest cheese and preserved meats. The hair of animals is badly matted by their presence.

Mitford, Mary Russell (1787-1855), an English writer. She was a native of Hampshire. Her mother died when she was a child. Her father was a spendthrift. He spent a fortune and became dependent on his daughter. She was very proud of his social qualities and sprightliness. At the age of ten she won a $100,000 prize in a lottery. Her scapegrace father spent it. She rented a small cottage and labored with her pen to keep up appearances. She wrote a number of books once popular but now forgotten. Her reputation as a writer rests on *Sketches of English Rural Life.* They appeared first as a serial in *The Lady's Magazine.* They were afterwards published in a volume under the name of *Our Village.* In these sketches her style is thought to resemble that of Irving. She is considered a forerunner of this kind of writing, now so popular.

Mitford, William (1744-1827), an English historian. He was a native of London and was educated at Oxford. On the advice of the historian, Gibbon, then a fellow officer in an English regiment, he undertook the preparation of *A History of Greece.* He was a Tory in politics. This so colored his views that he wrote of the Athenian democracy as though it were a treacherous rabble, and elevated Philip to the rank of a great statesman and military commander. His history has been superseded largely by that of Grote, a more accurate and trustworthy treatise.

Mithra, mith'ra, or **Mithras,** in Persian mythology, the god of light and later god of the sun. He stood as mediator between Ormuzd and the world. His worship was introduced into Rome and later into Germany. Of all the pagan deities Mithras was the last to give way to the influences of Christianity. Mithras is represented in art as a handsome youth wearing a Phrygian cap and tunic. He is kneeling on a bull which he is about to sacrifice. A dog, a serpent, and a scorpion are also attacking the bull.

Mithridates the Great (134-63 B. C.), king of Pontus. His original kingdom lay on the shore of the Black Sea. He subdued surrounding peoples and drove the Roman taxgatherers out of Asia Minor, expanding his kingdom to include even Athens. It cost the Romans three expensive campaigns to destroy his power. He was subjugated finally by Pompey, 63 B. C. Rather than fall into the hands of the Romans and follow the triumphal car of Pompey through the streets of Rome he took his own life. He was the most powerful opponent of Rome in the East. He was a man of great activity. He spoke several languages. Though many of his subjects adopted Greek dress and manners, his kingdom was essentially oriental. His career may be considered the last stand of the Orient against the West. History links his name with that of Hannibal. He was a man of great ability, a natural ruler, but the fates were against him. He was born in the East instead of the West.

The armor which fitted the gigantic frame of King Mithridates excited the wonder of the Asi

atics, and still more that of the Italians. As a runner, he overtook the swiftest deer; as a rider, he broke in the wild steed, and was able by changing horses to accomplish 120 miles in a day; as a charioteer, he drove sixteen in hand, and gained in competition many a prize—it was dangerous, no doubt, in such sport to carry off victory from the king. In hunting on horseback, he hit the game at full gallop, and never missed his aim. His intellectual wants he satisfied by the wildest superstition—the interpretation of dreams and the Greek mysteries occupied not a few of the king's hours—and by a rude adoption of Hellenic civilization. He was fond of Greek art and music, that is to say, he collected precious articles, rich furniture, old Persian and Greek objects of luxury—his cabinet of rings was famous; he had constantly Greek historians, philosophers, and poets in his train, and proposed prizes at his court festivals, not only for the greatest eaters and drinkers but also for the merriest jester and the best singer. He prosecuted the experimental study of poisons and antidotes as an important branch of the business of government, and tried to inure his body to particular poisons.—Mommsen.

Mnemosyne, nē-mŏs′ĭnē. See MUSES.

Moabites, a pastoral people who inhabited the mountainous country east of the lower part of the Jordan and of the Dead Sea, which was divided into two portions by the bed of the Arnon River; but the kings often resided in their native places. The chief divinity was Chemosh. Ethnologically, they were related to the Jews and were compelled to pay tribute to David. But some time during 850 B. C. they shook off this allegiance to the Jewish kings, later taking part with the Chaldeans against the Jews. They no longer exist as a people, the remainder of them having been absorbed by the Arabs.

Moabite Stone, a stone inscribed with 34 lines in Hebrew-Phoenician letters, discovered in 1868 among the ruins of ancient Dibon by the Rev. F. Klein. It was broken by the cupidity of the Arabs, who believed that it contained great wealth. But the pieces were laboriously put together, and the stone is now in the Louvre at Paris. It was discovered that the inscription formed a record of Mesha, King of Moab (II Kings, iii), referring to his successful revolt against the King of Israel. The characters are Phoenician, and constitute a link between those of the Baal-Lebanon inscription (10th century), and those of the Siloam text. Aside from its geographical interest, owing to the many names of sites in Moab which it records, it has great value as being one of the oldest inscriptions in the north Semitic alphabet.

Moberly, Mo., a city in Randolph County is on the Wabash and the Missouri, Kansas & Texas railroads. There are several public and high schools as well as private schools and academies, many excellent churches, three hospitals and fine residences. A new water works system has recently been completed which will give Moberly a pure and adequate water supply for many years.

Moberly is a busy town, with many factories and car and machine shops, and it carries on a large trade in farm produce, live stock, wool, hides, flour and brick and several varieties of hard wood. Population, 1920, 12,808.

Mobile, mō bēēl′, Ala., the second city and only seaport of the state, is the county seat of Mobile County. It is near the southeast corner of the state, on the left bank of the Mobile River where that stream enters into Mobile Bay. The city is thirty miles (the length of the bay) north of the Gulf of Mexico and 141 miles northeast of New Orleans. The population, which was 51,521 in 1910 had increased to 60,124 in 1920.

Mobile has an extensive and growing foreign and domestic commerce. The canalized Black Warrior, Warrior and Tombigbee rivers permit year around navigation for barges and boats with a draft of 8 feet to and from the coal fields of Walker County and to the steel and iron manufacturing district, near Birmingham, by way of the manufacturing cities of Demopolis and Tuscaloosa. The distance by river from Mobile to Cordova, from which coal is shipped, is 439 miles, and to the head of navigation on Locust Fork of the Black Warrior River, a point near Birmingham, is 423.5 miles. The river system has been canalized by the construction of 17 locks, having a total lift of 245 feet. The Waterways Service operates a barge line on these rivers as a part of the Mississippi-Warrior System. Steamboats can ascend the Alabama River to Montgomery, 410 miles northeast. There are regular steamer lines operating from Mo-

bile to almost every part of the world. Five different lines make regular sailings to U. S. ports on the Pacific, four to the Orient, six to the United Kingdom and one to New York. The Aluminum Line, to the West Indies, recently has been added to the list, making five steamer lines from Mobile to these islands. Water transportation is supplemented by the Louisville & Nashville, Mobile & Ohio, the New Orleans, Mobile & Chicago, the Southern and The Alabama, Tennessee & Northern railroads.

The city has an area of nearly fifteen square miles, is fifteen feet above the river, except along the water front, and is on a nearly level, sandy plain, which rises rapidly westward to Spring Hill and other elevated points. Except for the business section the city is not compactly built; the pleasant homes, many of the old houses of Colonial style, surrounded by gardens, and the broad, regular streets lined with ancient live oaks, magnolias and palms, give the place much charm.

Buildings. The chief buildings are the old Federal building, erected in 1840, the post office, completed in 1916, the Cathedral of the Immaculate Conception, the Scottish Rite Cathedral, Christ Episcopal Church and the main building of Spring Hill College, five miles from the city.

Institutions. In Mobile is the Convent and Academy of the Visitation, McGill Institute, Barton Academy, built in 1836, now the city high school, Spring Hill College (Jesuit) founded in 1830, and a city library. The city is the see of a Roman Catholic bishop. There are also a United States Marine Hospital, a city hospital, Southern Infirmary, operated by the U. S. Veterans Bureau, Alabama Maternity and Infants Hospital.

Industries. The Federal government has dredged the channel of Mobile Bay to a depth of 30 feet from the city to the Gulf of Mexico, a distance of 30 miles, and has completed the system of locks and dams canalizing the Tombigbee-Warrior river system, at a total cost for both projects of approximately $23,000,000. The city of Mobile has constructed a steel shed, 1,400 by 100 feet, on the municipal wharf, near the center of the water front. Exports and imports through the port of Mobile exceed one million tons per year, the exports being chiefly lumber, cotton, grain, naval stores, steel, iron and coal. The principal imports are tropical fruits, black strap molasses, hardwood, manganese ore and fertilizer, such as potash, nitrate of soda and sulphur. Mobile is an important cotton market and has become an important citrus market through the development of large acreage of Satsuma orange orchards. Raw and canned oysters, shrimp and vegetables, fish and box material are shipped to domestic markets. The industrial enterprises include six shipbuilding and repair plants, cotton mills, cotton compress, numerous sawmills and wood working plants and machine shops. Population, 1920, 60,777.

Mobile Bay, Battle of, an important and decisive naval engagement of the Civil War, fought on Mobile Bay, Aug. 5, 1864, between a Federal fleet under Rear-Admiral Farragut, and the Confederate **ram** *Tennessee,* three gunboats and the guns of Fort Morgan. The battle raged a whole day, was renewed after dark and continued until 10 A. M. the next day. The captain of the monitor, *Tecumseh*, disobeyed orders, with the result that his vessel was blown up. The channel was torpedoed, but Farragut ordered the course of his vessels straight across the torpedoes, which failed to explode, though they were felt to strike the vessels. The guns of the fort did little damage, and the Federal gunboats were released. No attempt was made to take Mobile at that time, on account of the shallow water.

Moccasin Snake, a venomous serpent allied to the copperhead and rattlesnake. About thirty to fifty inches in length. It is an exceedingly dangerous snake. It is of an inconspicuous brown; it lies in bushes overhanging water, or on the shore half in water, watching for frogs or fishes. It strikes venomously and without warning at the passer-by. It looks like clay. The whiteness of the inside of the mouth has given rise to the name of "Cotton-mouth." The poison does not act so quickly as that of the rattlesnake, but it is as deadly and

requires the same sort of treatment. The moccasin ranges from the Gulf to southern Illinois and Texas. See SNAKES.

Mocking-Bird, a bird of the Southern States remarkable not only for its own powers of song but for an ability, possessed in varying degree by different individuals, of imitating the notes of other birds. In length about ten and a half inches, with ashy upper parts, and soiled white plumage beneath. It is a familiar resident of parks and gardens everywhere from the Ohio Valley southward. Four to six pale greenish blue eggs are deposited in a coarse cotton-lined nest in a thicket or orange tree. It is a self respecting, highly esteemed bird like

Swinging aloft on a willow spray that hung o'er the water,
Shook from his little throat such floods of delirious music,
That the whole air and the woods and the waves seemed silent to listen.
Plaintive at first were the tones and sad; then soaring to madness
Seemed they to follow or guide the revel of frenzied Bacchantes.
Single notes were then heard, in sorrowful, low lamentation;
Till, having gathered them all, he flung them abroad in derision,
As when, after a storm, a gust of wind through the tree-tops
Shakes down the rattling rain in a crystal shower on the branches.

—Longfellow, *Evangeline.*

Mocking-bird.

the northern robin, and is held by its admirers to be a rival of the European nightingale as a musician. Its movements remind one of a catbird. Lanier writes:

Superb and sole, upon a pluméd spray,
That o'er the general leafage boldly grew,
He summed the woods in song; or typic drew
The watch of hungry hawks, the lone dismay
Of languid doves when long their lovers stray,
And all birds' passion plays that sprinkle dew
At morn in brake or bosky avenue.
Whate'er birds did or dreamed, this bird could say.
Then down he shot, bounced airily along
The sward, twitched in a grasshopper, made song
Midflight, perched, prinked, and to his art again.
Sweet Science, this large riddle read me plain:
How may the death of that dull insect be
The life of yon trim Shakespeare on the tree?

Then from a neighboring thicket the mockingbird, wildest of singers,

Modern Woodmen of America, a fraternal insurance order. It was founded in 1883. The insurance of members at actual cost is a prominent feature. The scandals connected with the management of the large old-line insurance companies gave the Woodmen an additional impulse. According to a recent report of the secretary of the association, there are now 13,870 local camps and 1,056,000 members in good standing. The number of members to whom pensions were paid during the preceding September was 9,333. One hundred and eight new camps were chartered in the month named.

Modjeska, Helene (1844-1909), a great Polish-American actress. She was born in the Austrian city of Cracow, of Polish parents. Her father was a fine musi-

cian, and numbered among his friends many artists. Two of her half-brothers became actors, and the young girl wished to go upon the stage but her mother and her guardian—for her father died when she was very young—opposed her doing so. When she was fifteen, however, the loss of some property compelled her to earn her living, and she turned to the stage. There she met with immediate success, and in 1865 became leading lady at the theater of Cracow. She had married her guardian, Modrzejeweski, and he helped to organize her companies. After his death she married Count Bozenta, who also became her devoted manager. Modjeska, her stage name, is a shortening of Modrzejeweski. Both she and Count Bozenta had aroused the displeasure of the Russian government, and in 1876 they emigrated to America, going to a ranch near Los Angeles. In this country her acting was as much admired as in Russia, and for thirty years she delighted American audiences with wonderful interpretations of parts such as Rosalind in *As You Like it,* Ophelia in *Hamlet,* Juliet, Viola and other Shakespearean women. She ranks high among the greatest actresses of her day.

Moeris, Lake. See FAYUM.

Moffat. See LIVINGSTONE, DAVID.

Mohair. See ANGORA WOOL; GOAT.

Mohammed, or **Mahomet** (570-632), the founder of Mohammedanism. He was born at Mecca. His father was a man in reduced circumstances, but he belonged to the Koreish, a tribe in charge of the sacred Caaba. There is a tradition to the effect that the father was a handsome man, and that no less than ten score virgins died of broken hearts on the occasion when he took a bride. Mohammed was an only child. The father died before he saw his boy. The mother died when the lad was six; his grandfather when he was eight. He was brought up by an uncle. The Koreish were not prevented by their religious duties from engaging in commerce. Mecca was then, as now, a place of holy pilgrimage and the seat of an annual festival and fair. Mohammed accompanied the caravans of his relatives on more than one occasion. He became acquainted with both Jews and Christians in what were, to the Arabs, remote parts of the world. He engaged particularly in the service of a wealthy widow, whom later he married.

The Arabs were idolaters, worshipers of many gods. They were of blood akin to the Israelites. There were religious reformers, who preached the need of a purer form of religion. Mohammed became impressed by their teaching. He retired frequently to solitary places to pray and commune. He appears to have been subject to a sort of religious frenzy, bordering on fits. Upon coming out of one of these, he declared that he had received a divine revelation to reform the faith of his people and to bring them to a belief in the one only God. The first convert was naturally his wife, next a faithful servant, and later a nephew. As soon as his teaching began to attract attention his followers were obliged to meet in secret places in the mountains that surround Mecca, or in houses privately. Persecution arose and many of his adherents fled to Medina.

The merchants of Medina, who came with their caravans to the annual feast and fair, were much more impressed by the preaching of Mohammed than were his fellow citizens. On one occasion twelve of them met with him and professed a belief in his teachings. A year later they returned to the fair. Though still converts in secret their number had increased to seventy. In 622 the opposition to Mohammed was so bitter in his native city, and the merchants of Medina were so pressing in their invitation to Mohammed to remove to their city, that the prophet and his Mecca followers migrated to Medina. This is known in Mohammedanism as The Hegira, or The Flight. It is the date from which Mohammedan history is reckoned. The Mohammedan era began 622 years after ours, and their year is ten days shorter. The new year beginning 1341 fell on our January 18, 1923. The new year, beginning the Mohammedan year 1342, falls on our August 13, 1923.

Mohammed was at the time of the Hegira merely a religious preacher or exhorter. In Medina, the number of his followers increased rapidly until, by virtue of being at the head of the new church, he found himself at the head practically of a state. He

then enunciated the doctrine, that membership in the church was superior to all earthly ties. The tie between Moslem and Moslem was stronger than that between father and son. The next step was a natural one. Mohammed became a worldly leader. He led a force of his Medina friends to attack the Assyrian caravan of his former friends and neighbors, the merchants of Mecca. Rich booty was the reward. A thirst for plunder brought tribe after tribe to his support. The conversion of a tribe was arranged by diplomacy with the native sheik rather than by preaching to the masses. Local strongholds in various directions were stormed one after another. An army of 10,000 men intimidated Mecca to a peaceful surrender.

Mohammed had the shrewdness to announce that Islam, as he called his new religion, was but a purification of the faith of various religions held by the Arabs. He accepted the books of Moses, and pleaded for a return to the religion of Abraham and of Ishmael. He took possession of the Caaba at Mecca—the sacred stone to which all paid reverence—and made it, if we may so speak, the cornerstone of the Mohammedan religion, enjoining a pilgrimage thither at least once in the life of every Moslem. He went so far even as to exclude from its worship Arabs who did not join the reformed faith.

During its founder's life the Moslem faith was extended to the remotest parts of Arabia. Syria was wrested from the Roman Empire. Mohammed died in 632. During his short life he was a successful merchant, a devotee to the verge of fanaticism, a great religious teacher, and a successful military leader—the founder of an empire unequaled in extent. His teachings rose to prominence more quickly and have swayed the lives of more persons than those of any character known to history. He is said to have been a little above the middle height, and of commanding features. His diet was frugal. He was passionately fond of perfumes. Although he enjoined single marriage upon others, he himself had nine wives at the time of his death. He is represented variously as a kind and humane man and as a cold, perfidious assassin. It is probable that both estimates are true.

Mohammedanism, or **Islam,** the religion founded by Mohammed. The former term is that used by outsiders. The faithful use the term Islam, meaning by translation, "Submission to the will of God." Still another term is Moslem, akin to Islam, meaning "Believer." The followers of Mohammed entered upon a period of foreign conquest very soon after the death of Mohammed. They overran Asia Minor, Egypt, and Persia. Their conquests extended along the southern shore of the Mediterranean clear to the Atlantic Ocean. The Moors, as the Arabs are called in western history, crossed the Straits of Gibraltar and founded a kingdom in Spain. The Moslems extended their conquests eastward through Afghanistan, India, into southeastern Asia, and far northward into China. Though under many different governments, the Mohammedan faith now extends from Morocco on the Atlantic Ocean eastward to the Malay Peninsula and far into the isles of the Pacific. There are 7,500,000 Mohammedans in China, about 67,000,000 in British India. Islam is the prevailing religion not only of Arabia, Palestine and Syria, but of Persia, Asia Minor, Turkey, and the smaller states of central Asia. In the Malay Archipelago and the Pacific Islands are also found a large number of worshipers of this faith. A large number of Mohammedans are found in the larger American cities. There are not less than 221,825,000 Mohammedans in the world.

The six cardinal points of belief taught by the Koran left by Mohammed are belief in one God, and one only; faith in Mohammed as his prophet; faith in the Koran and its revelations; a belief in angels as ministering spirits; a belief in the resurrection and judgment day; belief in the doctrine of predestination, or God's personal rule in the world. The war cry of the Moslem is "There is no God but Allah, and Mohammed is His Prophet." As the Arabs were related to the Israelites, so their religion has many points in common with the Hebrew faith.

While none but its adherents would claim that Islam is the peer of Christianity, it must still be regarded as a wonderful advance over the heathen religions which it supplanted throughout an enormous extent

of territory. The Moslem is required to believe that all Moslems are his brothers and to keep faith with his fellows in the church. He is forbidden to use intoxicating liquors and the flesh of swine. Almsgiving and fasting are required. Five times a day, at morning, noon, afternoon, sunset, and night, he prostrates himself in prayer with his face toward Mecca. When the proper hour arrives, no matter where the true believer may be, he humbles himself in prayer. Friday is the religious day of the week. If possible, prayer should be said on this day in the nearest mosque. The voice of the muezzin calls to prayer. No bells are permitted; no images whatsoever are tolerated in a Moslem mosque, or in a Moslem home. Once in a lifetime the devout believer is enjoined to make a pilgrimage to Mecca. As he approaches the sacred city he bathes and puts on a pilgrim's robe. He walks around the Caaba, the sacred temple, seven times, offering certain prayers, kissing the sacred black stone at every turn. There are also other ceremonies to be performed. On the tenth day he is enjoined to cast seven stones at each of three pillars. His religious duties performed, he resumes his customary garb, and, if a merchant, follows this by chaffering and trading. The annual pilgrimage and feast is the occasion of a great fair at which enormous quantities of merchandise change hands.

There are many sects of Mohammedanism, possibly a hundred in all. To the candid reader the distinctions seem trivial. According to the teachings of the church, none can be saved outside of its pale. Abraham, Isaac, and Moses were great prophets. Christ was a greater prophet than these, and Jerusalem is a holy city; but the divine nature of Christ is denied. Mohammed is the greatest prophet whom the world has ever known. Many devout followers of Islam are looking for the appearance of a later prophet known as Mahdi. Many leaders have appeared in different parts of the world claiming to be the Mahdi. Mohammed Ahmed in Egypt, about 1880, claimed to be the Mahdi. He was followed by the Arabs with fanatical disregard of life. He gave the British soldiers much trouble before he and his forces were finally suppressed.

See ARABS; MOHAMMED; MOOR; ALHAMBRA; TOURS; ALEXANDRIAN LIBRARY; MOSQUE; MECCA.

> This is to acquaint you that I intend to send the true believers into Syria, to take it out of the hands of the infidels. And I would have you know that the fighting for religion is an act of obedience to God. . . .
>
> When you meet with your enemies, acquit yourselves like men, and do not turn your backs; and if you get the victory, kill no little children, nor old people, nor women. Destroy no palm-trees, nor do any mischief to cattle, only such as you kill to eat. When you make any covenant . . . be as good as your word. As you go on, you will find some religious persons that live retired in monasteries, proposing to themselves to serve God that way: let them alone, and neither kill them nor destroy their monasteries.—Abu-bekr to the Soldiers who conquered Syria.

Mohave, a tribe of North American Indians, of the arid and southwestern United States and northwestern Mexico, nearly all of them devoted to agriculture and the making of baskets and pottery. They make their homes on both sides of the lower Colorado River. Physically, they are among the finest specimens of the North American Indian. They live in huts of brushwood covered with sand, and cultivate corn, pumpkins, melons and beans, which with fish constitute their food. Tattooing is customary, and they cremate their dead. Their chiefship is inherited through the male line.

Mohave Desert, an arid region with little water or vegetation, located principally in San Bernardino County, California, which is a part of the Colorado desert. The Mohave River takes its rise in the San Bernardino range and is lost in the Mohave Sink.

Mohawk, a tribe of North American Indians belonging to the Five Nations, originally inhabited the valley of the Mohawk River. During the War of the Revolution they took the part of the British, and when the war ended they went to Canada, where they settled on lands along the Grand River assigned to them by the Canadian government. They were the leading tribe of the Iroquois and were looked upon as the guardians of the eastern door or frontier of the Confederacy, the Senecas being allotted the keeping of the western door. The territory of the Mohawk was believed to extend north as far as the St.

Lawrence and east to the Mohican and Wappinger country along the Hudson, and then south towards the Catskill Mountains. Their position therefore brought them into close touch with the early settlers of this region, who gave them firearms, and their name soon inspired terror in the adjacent tribes. This, however, led to much persecution, so that their seven villages were reduced to five, and whole clans were wiped out. See IROQUOIS INDIANS.

Mohawk River, a large stream which is one of the tributaries of the Hudson. Its length is about 135 miles. It takes its rise in the hills south of Booneville, flows in a southerly direction towards Rome, until it empties into the Hudson at Cohoes. Its waters make fertile the beautiful Mohawk Valley. It was at one time the highway to the Great Lakes, and American and British forces fought over it fiercely during the Revolutionary War. Its banks are dotted with thriving manufacturing cities, and with the Erie Canal and the railroads running parallel, it forms an important trade route between the Atlantic coastal states with their thriving manufacturing centers, and the states of the west.

Mohegan, or **Monhegan** an Algonquin tribe of North American Indians, related to the Mohican of New York, who formerly lived along the Thames River in Connecticut. They were at one time united with the warlike Pequot. The two tribes—the Mohegan and the Pequot—at one time were under the rule of Sassacus, the Pequot leader. After his death the Pequot and the Mohegan were ruled by the Mohegan chief. After 1676 this tribe was the only one of importance in southern New England. As they gradually became surrounded by white people, their number lessened, some joining the Scaticook and Brotherton mission bands. A small number remained at Mohegan, but through intermarriage with whites and Negroes they have almost lost their identity.

Little by little they sold their valuable lands to the colonies, until now they retain a small reservation in their original city of Mohegan, and although their tribe is practically extinct, they still retain official recognition.

Mohican, an Algonquian tribe that lived in New York on the banks of the Hudson river. They frequently waged war with the Mohawks. Today, those that remain live upon a reservation near Green Bay, Wisconsin, and are known as the Stockbridge Indians. They were a strong and brave people, and had attained to some degree of civilization. In the *Last of the Mohicans,* Cooper has given a realistic portrayal of the Mohican manners and customs.

The Mohicans constructed their houses by planting two parallel rows of saplings, whose tops were bent over to form the roof. Although they often resorted to trickery and deceit, they were acknowledged to be one of the most fearless tribes of their time.

Mohr, mōr, **Karl Friedrich** (1806-1879), a German philosopher. He was the son of a prosperous druggist of Coblenz. He studied chemistry at Heidelberg, Berlin, and Bonn. He succeeded his father in business, yet retired in middle life and became a professor of pharmacy in the University of Bonn. He is described as a man of winning manners, fond of music and poetry, devoted to his family. He had the misfortune, however, to antagonize not only the authorities of the church, but leading scientific men. Though one of the foremost scientists of the day, he received little credit from his contemporaries. His name is known now only to the historian of science. As early as 1837 he published a paper, *Concerning the Nature of Heat,* in which the following remarkable sentences appear: "Besides the fifty-four known chemical elements there is in the physical world one agent only, and this is called energy. It may appear according to circumstances as motion, chemical affinity, cohesion, electricity, light and magnetism, and from any one of these forms it can be transformed into any of the others." This enunciation attracted no attention at the time, but it is now recognized clearly as the doctrine, nothing less, of the conservation of energy.

Molasses. See SUGAR.

Molds, low forms of flowerless plants. Molds are related to microscopic bacteria and yeasts, but are easily seen. They grow in masses, consisting of innumerable

threads. An examination of mold growing on a decaying strawberry, plum, peach, potato, lemon, a piece of bread, bit of leather, slimy wall, rotting chip, old cheese, neglected ham bone, or exposed preserves, will reveal a mass of slender, thread-like runners following the surface, climbing above and among their fellows, or penetrating deep into the substance on which they feed. Molds have no roots in the ordinary sense of the word. The threads are jointed; that is to say, they consist of slender cells, end to end. Each cell absorbs largely for itself, and when it has had abundance, possibly in a few minutes, sends on a sprout or new cell, which in turn does likewise. Mold starts always on the surface and spreads rapidly.

At first mold plants are transparent and colorless, but in two or three days the fluffy masses grow more dense and felt-like from the crowding of branches, and begin to bear spores. They acquire color according to the kind of mold—creamy, yellow, green, red, blue, and black. A change of color indicates that spore bearing has begun. Botanists recognize molds and name them according to their color and manner of fruiting. Two typical forms of spore bearing may be described. In the case of blue mold, many tiny threads spring up vertically like a forest; each divides into a cluster of branches fine as a spider's thread. The slender branches dry into lines of almost microscopic spheres or spores, like beads on a string. They have a bluish tinge which gives the mold its blue appearance. The spores of black bread mold are inclosed in knobs or pin-head sacs at the ends of the slender branches of the upright stems. When ripe—black—the sac bursts open and sets the spores free.

Spores are exceedingly light. Every breath of passing air carries them away to travel and float and bound about by millions. Most of the spores come to nothing; but whenever one settles on a suitable, moist, lifeless plant or vegetable surface, it adheres, extends slender threads, and grows like its parent with marvelous rapidity. Except in the middle of oceans and deserts, the air is full of mold spores. They are bounding and rolling along over all exposed surfaces. Wherever air goes they go. Wherever one finds opportunity—moisture, warmth, dim light, food — it settles in; sends out a slender thread, and repeats the history of its parent. As food cannot mold without spores, the way to preserve food from molds is to keep the spores out, or else to establish such conditions of heat, cold, or dryness that molds cannot grow. A piece of paper tied over the top of a glass or jar may not keep out bacteria, but it is a sufficient protection against molds, provided spores within have been killed by heat. Exposure to bright sunlight kills any molds or mildew likely to grow on harness or clothing. Molds require moisture; so jellies and fruits keep better in a dry place. A pantry should be dry and well lighted. If canned or pickled goods mold when tightly sealed, the housekeeper may depend upon it that tiny spores were present before the articles were protected. Woodwork, wall paper, curtains, clothing, bedding, shoes, rags, waste paper, and carpets are all subject to molds, or mildews, which are simply molds of small growth. The musty smell noticeable in cellars and closed rooms is due usually to mold, and indicates that a good airing is needed.

Ripe fruit on the tree is covered with a delicate membrane or outer skin that prevents spores from getting a foothold. If the slightest bruise or puncture allows the first mold thread to enter, the mischief is done. For this reason, hand-picked and unbruised fruit is less liable to rot and brings a higher price than windfalls or fruits that show bruises. Fruit that is desired to keep should be handled with care and not thrown or dumped roughly. As long as the skin of an apple or pear is unbroken, mold cannot enter. Bruises that do not show at first make future decay possible and, under ordinary conditions, inevitable.

Strawberries, raspberries, and other soft, juicy fruit cannot be kept fresh for a long time, but an apple is well protected by nature and should keep for months. Shippers wrap fruit in squares of tissue paper for the double purpose of keeping spores out and of absorbing moisture, thus preventing the spores already in the fruit from growing. Molds do not prosper in cold, dry air. For this reason, refrigerator cars

packed with ice have been built to carry fruits across the continent. California fruits protected by ice are delivered delightfully fresh in all the cities of North America, and the fruits of the South are likewise sent by the trainload in all directions to the large markets.

Some foods are thought to be improved by mold. Roquefort cheese, for instance, owes its flavor to the particular green mold that feeds upon it. Molds perform a service in beginning the work of breaking up animal and vegetable matter for plant food. They open the way for bacteria. Without molds and other low forms of plants, the higher plants and animals could not long obtain food, and the earth would be uninhabitable. Ringworm, with one or two other afflictions characterized by an inflammation which proceeds from a central spot and continues its progress in the rim of a circle after the original center has healed, is due to a peculiar mold parasitic on man.

See YEAST; FUNGI; SMUT; RUST; BACTERIUM.

Mole, a small insect-eating animal related to the shrew. Of North American species, there are six on the Pacific coast and three in the Eastern United States. The smallest is the hairy-tailed mole. The star-nosed mole has a rosette of fleshy processes on the snout. It is fond of moist lands and is not a bad swimmer. The common mole is about six and one-fourth inches long, with a little pinkish bare tail looking like the half of an angle-worm. Except in size, the mole has no point of similarity to a rat. The nose projects half an inch beyond the mouth into a broad, flattened point, almost as hard as a bone. The stout, flat body is covered with fine, soft, gray fur. The fineness and shimmer of the fur give name to the cloth known as moleskin. The legs are short and stout. The hands are three-fourths of an inch wide and about an inch long. This length is half claw.

The mole dwells underground entirely. The parent moles excavate commodious chambers in a central location, and push out in every direction an inch or two beneath the surface in search of food. In making its way the mole first of all pushes its nose into the earth like a brad awl. It then thrusts forward first one paw and then the other, along the side of its face, and forces the earth sidewise. The hind legs are used to crowd the body forward into the passage. The mole is one of the most muscular animals known. It is quite capable of pushing its way through the roots of dooryard sward at the rate of 100 feet in twenty-four hours. In loose, plowed ground, it travels several times as fast. Its course may be traced usually by a waving ridge of loosened earth.

The mole lives entirely on insects, not on roots, as commonly supposed. Whatever damage the mole may do in a garden or meadow is unintentional. It should be remembered that it is in search not of roots, but of grubs, cutworms, beetles, and the like. Its teeth are fine and sharp, and are not suited to cut roots or gnaw grain. It has no intention of injuring the roots of vegetables or growing plants. Intelligent gardeners say that the mole does more good than harm in lawn or garden, as it never disturbs anything vegetable, save as the roots of plants are crowded aside a little in the search for insect food. The keepers of parks not infrequently introduce moles for the good they do in ridding the sward and tree roots of injurious insects. The French forbid the killing of a mole on the penalty of five francs.

The ears of the mole are so short as to be entirely concealed beneath the fur. The shrew has a bright little eye, but its larger relative, the mole, has so little use for eyes that they are rudimentary and sometimes closed; whence the expression, "blind as a mole." The young are brought forth, two at a time, in the deep nest mentioned. Here the mole family spends the winter below the reach of frost.

Moles are confined to north temperate latitudes. A similar animal carrying its young in a pouch is found in Australia. There are mole-like animals in Madagascar and a so-called "golden" mole in South Africa. All are insect eaters. A fossil skeleton has been found in Patagonia, but there are no living moles in South America.

See SHREW.

Molecule. See CHEMISTRY.

Molière, mō-lē-ēr′ (1622-1673), the assumed name of Jean Baptiste Pocquelin, a celebrated French dramatist. His father

was upholsterer and *valet de chambre* to the king Louis XIII, in which office his son succeeded him. The young man conceived a strong passion for the stage. His ambition being stimulated by the success of Corneille, he resigned his office at court, changed his family name for that of Molière, and formed a theatrical company of young persons of tastes similar to his own. For a dozen years or more this strolling troupe, with its leader as both actor and playwright, continued to travel from place to place, well received but not widely known. At last, having received permission to act before the king, Louis XIV, Molière was allowed to establish his troupe in Paris. In 1859 he presented *Les Précieuses Ridicules*. It is said that true French comedy dates from this play. The critic Ménage remarked on leaving the theater, "Henceforth we must burn what we have worshiped and worship what we have burned."

Molière produced many comedies, in which were mirrored faithfully the manners, the follies, and the fashions of the day. He continued to write, and to act the principal comic parts in his own plays until the last. He was far from well when his last production, *Le Malade Imaginaire* (The Imaginary Invalid) was presented. The exertion of acting produced convulsions, and he died within a few hours. Many of his plays had given offense to the clergy. He had been excommunicated, and, while dying, did not receive the last rites of religion, although he asked for them. The archbishop of Paris refused him burial in consecrated ground, but, on the intercession of the king, with whom Molière had been a favorite, the body was given Christian burial in the cemetery of St. Joseph's. The remains have been moved twice, and now rest at Père Lachaise, where a monument has been erected to Molière's memory. Some of Molière's best known comedies are *Les Femmes Savantes,* a satire on bluestockings, *L'Avare, des Prècieuses Ridicules, Le Misanthrope, Le Tartuffe,* in which an old hypocrite is exposed, *Le Bourgeois Gentilhomme,* and *L'Ecole des Femmes. Le Misanthrope* is one of the finest examples of modern comedy. Unlike many of Molière's it is more pleasing in the reading than in the acting. Among critics it contends with *Le Tartuffe* for first place among Molière's plays, although *Le Malade Imaginaire* is probably the most popular. Corneille, Racine, and Molière are the three great names in French drama. Racine excels in tragedy. Corneille produced both tragedy and comedy, and is justly celebrated for dignity of style and grandeur of sentiment. But Molière is the father of French comedy.

SAYINGS.

There are fagots and fagots.
There are no longer any children.
The beautiful eyes of my cash box.
Grammar knows how to control even kings.

SAID OF MOLIERE.

Whatever the theme, Moliere had a falcon's eye for detecting vice and folly in every shape, and talons for pouncing upon all as the natural prey of the satirist.—Botta.

Of all who have ever written, Moliere is the one who has observed men without seeming to do so. —*Americana.*

Moliere's private character was remarkable for gentleness, probity, generosity, and delicacy, qualities attested not only by anecdotes but by the evidence of documents. . . . He has the humor which is but a sense of the true value of life, and now takes the form of the most vivacious wit and the keenest observation, now of melancholy, and pity, and wonder at the fortunes of mortal men. In the literature of France, his is the greatest name, and in the literature of the modern drama the greatest after that of Shakespeare. —*Britannico*

Moliere belongs to no nation. One day the god of comedy, wishing to write, became a man, and happened to fall into France.—Kemble.

See CORNEILLE; RACINE; COMEDY.

Moline, Ill., an important manufacturing city, is situated on the Mississippi River at the mouth of Rock River, and on the Hennepin Canal. It is three miles east of Rock Island, which is opposite Davenport, Iowa, the three cities being linked by bridge, ferry and electric railway. The Mississippi River is dammed at this point from the Moline shore to an island, and excellent water power is thus produced. The city's principal manufactures are agricultural implements, especially plows, automobiles, tractors, steam engines, pumps, paper, steel, furniture and wagons.

Moline has a high school, graded schools, a library, a business college and several

beautiful parks. The city owns and operates the water works. In 1920 the population was 30,734.

Mollusks, a division of the animal kingdom, including oysters, clams, cockles, snails, mussels, and a multitude of other animals, all with soft, jointless bodies protected by shells. Mollusks are known in the market as shellfish; but the term shellfish is used to include lobsters, crabs, and prawns—animals with joints, belonging to another division entirely. The soft body of a mollusk is inclosed in a muscular skin called a mantle. The mantle has the power of covering itself with a limy shell. Mollusks with two shells connected by a hinge are called bivalves. The oyster, for instance, is sometimes spoken of as a "luscious bivalve." Mollusks multiply by means of eggs which they dispose of variously. They are particularly interesting on account of their shells. Few homes are without shells kept as curiosities. Many shells held to the ear produce a roaring sound like an echo from the sea, due to its reflection of sound waves. See OYSTER; CLAM; MUSSEL; CONCH; SNAIL; SLOE.

Molly Maguires, in Irish history, a secret association of tenants to resist the collection of rents. The original society was organized in 1843. Rent collectors were intimidated, and, where that was not enough, they were ducked in horseponds, whipped, stabbed, or shot in the back. A number of executions took place, but it was difficult to obtain testimony. A witness was pretty sure to feel the vengeance of his neighbors. The society went down with the disappearance of the evil it was designed to meet. In 1877 a Molly Maguire Society was formed by the Irish coal miners of Pennsylvania. It has the reputation of having been a murder society from start to finish. It terrorized the coalfields for twenty years. A detective force finally secured the conviction and execution of enough members to root the association out of existence. See ABSENTEE; LANDLORD; IRELAND.

Moloch, or Molech, the fire god of Phoenicia. According to tradition, his image was an iron furnace built in the form of a human being with outstretched arms designed to receive human sacrifice.

Molokai, one of the Hawaiian Islands, having a length of about 40 miles. It is notable for the leper settlement maintained there. Those afflicted with leprosy in the islands are sent here and kept isolated from those of the inhabitants who are healthy.

Moltke, Helmuth Carl Bernhard Count von (1800-1891). He was born in Mecklenburg and was educated at the Royal Military Academy of Copenhagen. In 1822 he entered the service of Prussia as a second lieutenant. He rose rapidly in the service. The years 1835-39 he spent in Turkey in the military service of the Sultan. In 1859 he was made lieutenant general of the Prussian army. With Bismarck, secretary of state, and Von Roon, minister of war, he formed the famous trio of Germans who laid the plans in accordance with which the German Empire was subsequently formed with Prussia at its head. In the war of 1866 with Austria and that of 1870 with France, it appeared that Moltke had prearranged the movements of his troops with a nicety of detail unknown in the history of military affairs. In 1888 he resigned from active command of the army, holding an honorary position until the time of his death. See BISMARCK; FRANCO-PRUSSIAN WAR.

Molucca, or **Spice Islands,** a name given to the group lying between Celebes and Papua. They form part of the Dutch East Indies, and are under the control of the Netherlands. The group consists of Amboina, Ternate and New Guinea, having together an area of 144,120 square miles. The population of Amboina in 1920 was 243,543; Ternate, 149,241; that of New Guinea was not available.

The islands, to the number of several hundred, are mountainous, often volcanic, and earthquakes are frequent. There is a luxuriant growth of tropical trees and flowers, and among these, birds of gorgeous plumage and insects of dazzling hues abound.

Spices and sago are exported to Europe, and birds' nests to China. For centuries these islands have been owned either by the Spaniards, Portuguese, or the Dutch. The natives are of the Polynesian and Malay races, and the language is largely Malay.

Mommsen, mŏm'sen, **Theodor** (1817-1903), a German historian. He was a native of Schleswig. He died at Berlin. He was educated at the University of Kiel. He held various university positions at Leipsic, Zurich, and Breslau. During the revolutionary period, 1848, he was an advocate of progress and reform. Following the Franco-Prussian War, he was a member of the lower house of the Prussian Parliament. He opposed Bismarck's policy both with reference to the Catholics and the tariff. In 1858 he was appointed professor of ancient history in the University of Berlin. In spite of his interest in modern politics he is best known as the author of *The History of Rome* in five volumes. Though one of the most remarkable scholars of the day, whether considered as a decipherer of inscriptions, a historian, a lawyer, an expert on coins, or as a student of language, his volumes are written in a popular style without mention of authority. His is the most readable, and, we may say, the most authentic history of the Roman Republic that has yet appeared. It has been translated into the leading languages of the world. It is the standard authority in libraries everywhere.

Monaco, mŏn'ä-kō, an independent principality on the Mediterranean, inclosed landward by France. It lies about nine miles east of Nice. It is a rocky bit of hilly coast with an area of but eight square miles. The population is 15,180, residing chiefly in three cities of which Monaco and Monte Carlo are best known. Olive oil, citrons, oranges, and perfumes are exported, but the principal business of this diminutive kingdom is that connected with hotels and gambling. The climate is considered delightful. Winter resorts are maintained on a magnificent scale. A syndicate of gamblers with a capital of $6,000,000 pays the petty prince of the realm for a monopoly of gambling privileges. In 1904 the sum of these payments had reached a total of $1,130,000. The concession runs to 1937, at which date the annual payments are to have risen to half a million a year. Far from being confined to shady, disreputable characters who gamble in private, the hotels and the gambling palace, the Casino, of Monte Carlo are frequented by a brilliant throng, at times a crush, of the most fashionable people in Europe. Many stake and lose or win entirely within their means. Others in their desperation stake family jewels and mortgage their all in hope of winning back what they have lost. Suicides are of frequent occurrence. For one form of play, see ROULETTE.

Monarchy. See GOVERNMENT.

Monasticism, a system of religious communities. *Monk,* from the Greek, signifies one who dwells alone, a hermit. The original monks were hermits. The first monastery was a settlement of monks who gathered around a monk celebrated for his piety. The term monasticism is of general application to the religious orders not only of Christianity, but to those of the Moslems, Jews, Buddhists, and Brahmins. Without doubt the origin of the monastery is oriental and Jewish. In the time of Christ we read of wayfaring people who lived a half ascetic life. The first monastery on record grew up under Paul the Hermit in upper Egypt about 250. A century later, we find a monastery of 1,400 monks on an island in the Nile. Before the death of its founder the number is said to have risen to 7,000. The inmates lived in cells hewn in the rock, three monks to a cell. They were divided into circles or groups, each having a common table. They lived on bread and water supplemented by oil and salt, with occasional fruit and vegetables. They ate their frugal meals in silence, while an elder brother read extracts from the Scriptures or some other edifying volume. They met twice daily for prayer and had special services on Sunday. They tilled the soil to raise wheat and vegetables for their own use. They wove mats and baskets for sale to procure such necessities as they could not produce. As time went on blacksmiths, tailors, boat builders, tanners, and other tradesmen developed among them. Monasticism spread rapidly from Egypt to Syria, Palestine, Asia Minor, Armenia, and even into Mesopotamia.

Religious orders of women were established at almost the same time. It is estimated that during the fifth century there were not less than 100,000 monks and nuns in Egypt. In Syria a peculiar form of austerity was developed.

The monasteries of the eastern church were shaped largely by the influence of the monkish reformer, St. Basil. There is at the present time but one order in the Greek Church. The first monastery in Rome was established in 340 by Athanasius. It likewise was based on the Egyptian type. Monasteries spread rapidly throughout the West. Various orders for men and women sprang into existence. The total number falls a little short of 200. The monastic code most famous in the West, the one at the basis of nearly all monastic orders, is the rule of St. Benedict. The code which he published for the government of his monastery and of monasteries subsequently affiliated with him in the Benedictine order consists of seventy-three chapters. The monks are required to pass through a period of probation extending over many months. At the end of this time, they are free to withdraw if they have formed an unfavorable opinion of the order, or of their own ability to comply with its rules. Silence, humility, and obedience to superiors, even to seniors, is enjoined absolutely. Worship, study, and work are the rules of practice. The hours of sleep, study, and work are established. Punishments for infractions of the rules are prescribed. Complaining is treated as a grievous offense. The monks are forbidden to receive presents without permission of the abbot, and are on no account permitted to hold property. Luxury in all its forms is forbidden. The monks are assigned to labor in the kitchen, guest room, dining room, workshop, or field, each according to his individual capacity. The monasteries of Cluny founded in France about 910 had a wide influence in recalling the western monasteries to the simple rules of St. Benedict. During the time of the Crusades military orders arose. The Templars, the Hospitalers, known afterward as Knights of Malta, and the Teutonic Knights were formed for the defense of Christendom.

Monasteries were of incalculable service in spreading Christianity and civilization throughout western Europe. Wherever a monastery was established among the semi-barbarian people, good buildings, meadows, and fields were soon in evidence and served as models to the surrounding people. Sick rooms were maintained in which the wounded and ailing might receive medical attendance. The monasteries were houses of rest for the traveler and places of refuge from the exactions of the strong and the attack of the robber. For centuries the monks kept learning alive. For centuries the monks were almost the only persons who were able to read and write. They alone had libraries. Some of the monasteries under the lead of learned abbots, or lay brothers, become practically colleges for the instruction of young people. Much the same testimony is given by the unprejudiced historian in favor of convents. The sisters taught music, lace making, painting, and the household arts. In the total absence of other schools the convents were centers of intelligence and refinement where young girls were sent to learn.

With the growth of civilization and its comforts, however, the work of the monasteries became less essential. Other civilizing features, such as schools, colleges, books, and churches came into play. The monasteries monopolized an immense amount of property. Great areas of the most fertile land were under control of the monasteries, and revenues which a prince well might covet were derived from them. As Christianity became the universal belief and the work of the monks changed from preaching the faith to the collection of revenues, there was, in the case of many establishments at least, a deterioration in the manners and morals of the earlier monks. Charges of riotous living were rife and were believed readily. With the Reformation came a general crash. Monasteries were suppressed entirely in Protestant Germany and in Scandinavia. In England 1,616 houses with an annual revenue of $7,000,000, equivalent to several times that sum at the present day, were suppressed, good and bad together. Not less than 40,000 families were enriched by lands taken from the English monasteries. At the time of the French Revolution 820 abbeys and 225 convents were closed by order of the Assembly. The various Catholic countries of Europe have had times of hostility to monasticism. Spain dispossessed 900 monasteries by a single act in 1835. Portugal took action a year earlier closing 500 houses. Upon attaining their freedom from Spain,

the various Latin states of the New World, notably Mexico, Chile, and Brazil, passed severe measures confiscating the property of the monasteries. Switzerland followed in 1847. The unification of Italy in 1870 was followed by the appropriation of the property of the various orders, with few exceptions, by the state. Between 1870 and 1882 2,555 establishments were condemned and their revenues seized.

There is some reason to think that the state did but too roughly and harshly what the church should have done more gradually and wisely. Pius IX is credited with the remark, which he very probably never made: "It was the devil's work, but the good God will turn it to a blessing, since their destruction was the only reform possible to them." At the present time, France is the most aggressive country in Europe in opposition to monasteries. By the association's law of 1901 in France, all religious communities must be authorized by the state, and no monastic associate may exist except by special permission. Only a few associations now exist in France. In Germany all orders but the Jesuits now have the greatest freedom. In Great Britain and Ireland all repressive acts have been repealed. There is a revival of religious orders, especially in England and in Italy. In the United States religious freedom is guaranteed by the national Constitution. The various American monasteries and convents shelter about 8,000 male and 45,000 female members. See LINGARD.

Monck, Charles Stanley, Fourth Viscount (1819-1894), a British statesman and colonial administrator, was born at Templemore, County Tipperary, Ireland, and was educated at Trinity College, Dublin. Called to the Irish bar in 1841, he made rapid progress in his profession; in 1852 he was elected to Parliament as a Liberal and was reelected three years later. From 1855 to 1858 Monck was Lord of the Treasury, and in 1861 he was appointed Governor-General of Canada. He entered upon his duties at the time when the legislative union of 1841 was breaking up, and the governmental machinery was locked before he had been in Canada a year. Only by the display of tact, courage and an equable temper did Monck obviate serious trouble. He prevailed upon George Brown to enter the coalition cabinet in 1864 and otherwise worked for more friendly feeling between factions. He believed in and worked for confederation, and when the Dominion of Canada was formed, Monck was made its first Governor-General, 1867. Thus he held this important position twice. He resigned in the next year, and in 1871 was appointed to the Irish national educational committee and to the commission that effected the disestablishment of the Irish church. In 1882 he was appointed to the commission charged with administering the Irish Land Act, but resigned in 1884. In recognition of his services to Canada he was made viscount in the English peerage in 1866.

Moncton, New Brunswick, the second city of the province, is at the head of navigation on the Petitcodiac River, which flows into the Bay of Fundy. It is 89 miles northwest of St. John, N. B. Moncton is the eastern terminus of the Grand Trunk and the Intercolonial railroads, both of which maintain building and repair shops here.

This city is in the center of a natural gas field, the gas being used by manufactories of underwear, hats and caps, leather and harness, mattresses, barrels, lamp chimneys and other glass ware, wire fences, biscuits, flour, grist and other commodities. An extensive trade in the products of these factories is carried on by rail and by water

Moncton has six public schools, two fine parks and good golf links. There are several commodious hotels; other notable buildings are the railroad offices, the combined city hall and market, the post office and the Y. M. C. A.

Monday, the second day of the week. As among the ancients, the first day of the week was sacred to the sun, so the second was sacred to the moon, and received from the Romans the name Lunae Dies, or "day of the moon." The word moon is Anglo Saxon and our Monday is a contraction of "moon day."

Monessen, Pa., a borough in Westmoreland County, is on the Monongahela River, 39 miles south of Pittsburgh. It is served

by the Pennsylvania and the Pittsburgh & Lake Erie railroads. From the industrial establishments of Monessen issue structural and sheet steel, tin-plate, wire fence, lumber, boxes and bricks. Coal and iron are mined in the vicinity.

Monessen has grown from a town of 2,197 inhabitants in 1900 to a city with 18,178 in 1920. The city has a good system of public instruction, a library, a court house, a post office and several handsome churches.

Money, that which passes freely from hand to hand in settlements of debts or purchase of commodities. Money, to be money, must be acceptable to everyone in exchange for any article he may desire to sell. The money of a civilized people may not be understood or it may not be usable by savage people. It may have no purchasing value, and hence it may cease to be money.

The more primitive a people the more primitive its money is. Furs, grain, and shells have all served their turn as money. Opium passes in some parts of China. Bricks of tea are acceptable in Mongolia Cowrie shells are still current in Siam. Beads still pass in parts of Oceanica and Africa. The early colonists of Virginia paid their preachers in tobacco. The traders of the North reckoned values in beaver skins. Among coinage nations, the less advanced the civilization the smaller the value of the coins demanded by the necessities of the people. An American quarter changed into the copper cash of the Chinese would fill one's pocket with an uncomfortable weight. We may also say that the lower the standard of wages, the smaller the coin required in commercial transactions. The current coin of western Europe, the mark, franc, or shilling, worth from eighteen to twenty-four cents, replaces the American dollar. The coin in which car fares are paid and small change is made is correspondingly small. In the western part of the United States, where money flows more freely and expenses are on a larger scale, trade disdains the cent piece of the Eastern States. Prices of the smallest articles are made in even nickels.

The amount of money in the world at the birth of Christ is estimated at $1,800,000,000. By 500 A. D. the amount had fallen one-third of that sum. In the day of Charlemagne commerce and industry had become so paralyzed that the amount of money is put at $200,000,000, or one-ninth of the sum first named. The discovery of America stimulated activity in all lines of industry. The New World supplied a vast quantity of the precious metals, most of which was coined. The world's supply of money rose rapidly from century to century.

The principal coins in use with their value in United States dollars on March 20, 1927, were as follows:

Country	Montary Unit	Value
EUROPE:		
Austria	schilling	$0.14068
Belgium	belga	.1390
Bulgaria	lev	.007248
Czechoslovakia	krone	.029614
Denmark	krone	.2664
England	pound sterling	4.8551
Finland	markka	.025206
France	franc	.0391
Germany	reichsmark	.2372
Greece	drachma	.021289
Holland	guilder	.4001
Hungary	pengo	.1730
Italy	lira	.0455
Norway	krone	.2613
Poland	zloty	.1139
Portugal	escudo	.6514
Rumania	leu	.005980
Spain	peseta	.1756
Sweden	krona	.2675
Switzerland	franc	.1924
Yugoslavia	dinar	.017585
ASIA:		
China	Chefoo tael	.6333
China	Hankow tael	.6221
China	Shanghai tael	.6036
China	Tientsin tael	.6354
China	Hongkong dollar	.4852
China	Mexican dollar	.4400
China	Tientsin or Peiyang dollar	.4300
China	Yuan dollar	.4275
India	rupee	.3633
Japan	yen	.4916
Singapore (S.S)	dollar	.5596
NORTH AMERICA:		
Canada	dollar	.999449
Cuba	peso	1.00469
Mexico	peso	.470067
Newfoundland	dollar	.997063
SOUTH AMERICA:		
Argentina	peso - gold	.9599
Brazil	milreis	.1184
Chile	peso	.1201
Uruguay	peso	1.0119

Mongolia, mŏn-gō'lia, a vast central and eastern region in Central Asia belonging to China. It lies between latitudes 35° and 52° north and longitudes 82° and 123° east. This is between China proper and Siberia. Mongolia is bounded on the north by Asiatic Russia, on the east by Manchuria, on the south by China proper and on the west by the Sungari and by East Turkestan. Its estimated area is 1,367,000 square miles and it has about 1,800,000 inhabitants, divided into tribes, among the chief of which are: the Khalkas, or Mongolians proper, the Ouryantai and the Darkhat, or Mongolized Turks, the Ordos, of pure Mongolian blood, and the eight tribes of the Tsaktar. The capital is Urga, a mountain city of 30,000 population, situated in the Tushetukhanate.

Under Genghis Kahn the Mongolians made themselves masters of China. They levied tribute on the Russians, invaded Poland and Silesia and extended their conquests even to Moravia and Hungary. *The Flight of a Tartar Tribe* by De Quincey relates a return movement of this strange people. Subsequently they were expelled from China. The great Chinese wall was built over mountains and across valleys to keep them out of the Chinese territory. The Mongolians gave their name to the race. They are related to the Japanese and the Chinese. They are short people with broad noses, high cheek bones, oblique eyes, straight black hair, and a yellowish skin. The people are Buddhists. The business of the province is confined chiefly to the transportation of goods by caravans over several routes between China and the Russian empire, and to the raising of cattle, camels, sheep, horses, and other domestic animals. Mongolia is ruled by a native chief chosen by the Mongolians themselves. He rules in conjunction with a representative of China, the two acting together in all important matters. The Mongolian wears a cone-shaped skull cap of red silk terminating in a tassel or button and having an upturned brim of black velvet. He wraps himself in a long cotton or silk tunic in the summertime and, in the winter, wears a coat of a sheep or deerskin, or else a fur-lined silk garment. Like the Chinaman, he shaves and wears a queue. White trousers and calico shirts are worn.

The recent political history of Mongolia is interesting. The princes and princelings of Mongolia came into conflict with the Manchu rulers of China for some years before the latter were overthrown, because of their penetration, more or less peacefully, into Mongolian territory. In Outer Mongolia this had the effect of driving the Mongol chieftians into a separatist campaign and to Petrograd for help against the Manchu. Russia recognized Mongolia's independence in 1912 and sought to aid the Mongolians against the colonization of their country by Chinese. This protection obtained down to the Russian revolution, but that event changed the state of things Mongolian, and in 1919 the Chinese government secured the consent of the Mongolian government to annex their country to China. At this juncture the Russians stepped in with a protest against the annexation and an insistence on Russia's treaty rights in Mongolia. Not all of the Mongols were satisfied with the alliance, and the brutality of Chinese troops in the country resulted in open warfare between the Chinese and the Mongols; the latter were aided by Russians and Japanese. Conflict among these elements is likely to continue. See CHINA, REPUBLIC OF.

Monitor and Merrimac, two famous ships of the Civil War. The Merrimac was a United States wooden frigate which had been sunk by the Federal authorities when the Norfolk Navy Yard was abandoned. The Confederates subsequently raised the ship and proceeded to cover its sides with iron plates, renaming it the Virginia. The United States Navy Department was aware of what was going on and dreaded the appearance of this new type of ship. In the meanwhile an association was building the Monitor at Greenpoint, Long Island. Plans for a new type of ship had been furnished by John Ericsson. The main feature was a revolving iron-plated turret placed in the center of a long, cigar-shaped hull that rose but a little above the water, "a cheese hoop on a raft." The turret carried two eleven-inch Dahlgren guns. The turret was nine feet high and was covered with iron plates

eight inches thick. The hull was also plated with iron. The extreme length was 172 feet. The greatest breadth was forty-one feet. The Monitor cost $275,000. But 100 days were occupied in building it.

March 8, 1862, the Merrimac entered Hampton Roads and destroyed the Congress and the Cumberland, driving the Minnesota aground. The heaviest cannon of these ships were unable to damage the iron-plated hull of the Merrimac. It was evident that this ship could compete with any number of other vessels. The greatest excitement prevailed throughout the North. The Southern leaders were exultant. It seemed for a few hours as though the Merrimac might be able to clear the entire Southern coast of Federal ships. About two o'clock the next morning, however, the Monitor appeared on the scene and anchored by the Minnesota. When the Merrimac sailed up the channel to renew the conflict the insignificant looking Monitor steamed out to do battle. The shot of the Merrimac glanced harmlessly from the deck and turret of the Monitor; the latter's heavy guns told severely on the Merrimac. The prow of the Monitor was used also with effect. The Merrimac aimed to ram the Monitor, but was unable to accomplish anything. The battle was a draw. The Confederate ship finally steamed away to Norfolk, leaving the Monitor master of the situation. The engagement is remarkable in the annals of naval warfare, not only as a critical turn in the affairs of the war in which it occurred, but as marking the end of wooden warships. The nations of Europe set about building armored ships without delay. The plans of the Monitor and Merrimac were combined.

While off Cape Hatteras on the way to Beaufort, South Carolina, the Monitor sank December 29, 1862. Sixty vessels were built on much the same plan before the end of the war.

See ERICSSON; BATTLESHIP; NAVY.

Monk, George (1608-1670), an English soldier. He is noted in English history as a brilliant commander and an unprincipled politician. He entered the British service at the age of seventeen and served under Sir Richard Grenville. At the opening of the Civil War in 1640 he fought for the king and was taken prisoner. He was released soon and took the field for Parliament. He was sent to Ireland, then recalled and reprimanded at the bar of the House for what seemed a betrayal of the cause; yet later he rose to command of the ordnance under Cromwell and was charged with the pacification of Scotland. In 1652 Cromwell made him commander of the fleet. He gained two signal victories, one over Van Tromp, the Dutch admiral. At the death of Cromwell and the virtual collapse of the Commonwealth, Monk scattered the English army with skill so that concerted opposition to the Stuarts was out of the question. He manipulated Parliament so that it could not oppose their return. Charles II, who was thus enabled to resume the throne of his fathers without the shedding of blood, rewarded Monk with the title of Duke of Albemarle and gave him a pension of $35,000 a year. For the humorous side of Monk's life, the reader may consult *Pepys's Diary*. See MARLBOROUGH.

Monk. See MONASTICISM.

Monkey, in popular language, any animal having four hand-like feet. With the exception of the monkeys of Japan and China, all dwell safely within the frost line of the tropics. The monkey world reaches its highest development in tropical Africa, precisely where man is near his lowest limit. Passing by man, the zoölogist finds it convenient to separate the order into seven groups.

1. THE MAN-LIKE APES. The gorilla and chimpanzee of Africa and the orang-utan of Malaysia are large, heavy, strong, coarse animals. The gibbons of Borneo, Siam, and Malaysia generally, belong to the same group, but they are a delicate, spidery folk almost without flesh. The forearms of a large specimen may be extended to a distance of five feet or over, and yet the owner weighs only ten pounds. There are several species—shy, affectionate fellows, swinging off through the tree-tops on the approach of man. Nothing will tempt them to stay within sight, but at the cry of a captured young one, the whole troop comes swinging back recklessly, almost in the very face of the hunter, in the greatest anxiety to recover the luckless infant. Like the other apes, the gibbon is without a tail, but

it makes wonderful progress with its four slender, lithe arms. William T. Hornaday, who observed the gray gibbon of Borneo, writes: "The most wonderful habit of the gibbon is its flight down hill when pursued. Of course, it never dreams of descending to the earth, but in the half-open hill forests of Borneo I have seen these creatures go downward through the tree-tops, in a straight course, leaping incredible distances, catching with their hands, swinging under, catching with their feet, turning again, and so on by a series of revolutions, almost as fast as the flight of a bird."

2. The Old World Monkeys. The second group includes the monkeys and baboons of the Old World. None of them have grasping tails. The space between the nostrils is very narrow. Of these the best known is the Barbary ape of Gibraltar and North Africa. This is the original monkey of the European organ-grinder, the animal that has given meaning to the words monkey and ape and to which the literature of Europe is full of allusion. It is a restless, mischievous, apt, imitative waif, ready to dance, climb the rope, stow away crackers in cheek pouches, or to doff its cap and collect pennies. The Italian, his organ, and his monkey in a tawdry red suit, have made themselves fairly well known. The most northern of all monkeys is the sturdy, quick-tempered, red-faced monkey of Japan. It is clothed with an abundance of long, shaggy hair, and is no more afraid of snow than is the red squirrel. The most beautiful of all monkeys is the Diana monkey of West Africa. It wears a dainty suit of black, white, gray, and brown. Many of the Old World monkeys are strikingly colored. One African monkey is green in color. Many species have bare, sometimes brilliantly colored, buttocks. In size these monkeys vary quite as much as the dog. As a group they are more active and intelligent than the New World monkeys.

3. The New World Monkeys. They are found between the limits of northern Mexico and southern Brazil. They live in tree-tops. Several species follow timber up the Andean Mountains into a region of considerable cold. American monkeys have long, lithe tails. The under surface is bare. The tail curls about a branch naturally, and carries the weight of the owner with perfect comfort. By curling its tail over a branch, the monkey can swing at ease with all four hands free for fun or for gathering fruit. In traveling, too, the American monkey swings by foot or tail indifferently. In crossing streams, for the monkey dreads the ground and wet feet, a troop of monkeys forms a living chain. Each grasps the tail of the one ahead of it. This chain swings to and fro from an overhanging tree on one side of the stream until the lowest member is able to catch a branch on the opposite side. The rest of the band, especially the young and laden mothers, cross on this bridge of relatives. The last monkey lets go, the chain swings over, and the monkeys are off in the forest—all in less time than is required to describe this living rope. A similar method is employed in reaching fruit at the tips of branches otherwise out of reach. The American monkey is without cheek pouches. The nostrils are set widely apart. The buttocks are hairy. The hind limbs are usually longer than the fore limbs. There are many species. The capuchin or ringtail "has a wrinkled and careworn face, as if burdened with sorrows." It frequents Central America. The body is gray, brown, or black, with white forehead, throat, and shoulder points. The spider monkeys are well named for their agility and slimness. They seem all legs and tail. The Mexican spider monkey is the most northerly American monkey. The owl monkeys have large, strong, owl-like eyes, and, like the owl, they feed at night. The agile squirrel monkeys are thus named from their size. They are fond of insects. They will clean a house or ship of cockroaches in short order. The shaggy saki of the Andes has a long, black, chin beard. The Yarkee of the upper Amazon resembles the red-faced monkey of Japan. The howlers have a sound-box of cartilage in the lower jaw. Sleep is impossible within a mile of a troop of these noisy animals.

4. The Marmosets. These are small monkeys found from Mexico to Brazil. The species vary in size from a chipmunk to a cat. They are soft, silky, bright-eyed fellows, with long, fluffy tails. They are interesting household pets.

5. Lemurs. A Madagascar and ori-

ental group. They have the body and nose of little foxes, the tail of a marmoset, and the hands of a monkey.

6. THE AYE-AYE. A lemur-like animal of Madagascar, so named from its cry. It has the face, ears, and teeth of a bat. The body is that of a cat. The tail is long and bushy. The fingers are long and slender and armed with nails. It lives in bamboo jungles on the larvae of certain insects found on the trunks of the bamboo.

7. THE TARSIERS. Small lemur-like animals of Africa and the Eastern Archipelago. One species spends its time in the tree-tops of the Philippine Islands. It is a grotesque, grayish brown, squirrel-like animal, with olive spots. The tail is bare save a tuft at the end. The tarsiers are so named for their long hind legs. They feed at night on fruits and insects.

See APE; GORILLA; CHIMPANZEE; ORANG-UTAN; BABOON; LEMUR.

Monmouth, James (1649-1685), an English duke. He was the son of Charles II and Lucy Walters. During the rule of the Commonwealth he was educated in France. On the restoration of the Stuarts his father called him to England and recognized him as his son, making him Duke of Monmouth. He commanded the English forces at Bothwell Bridge in 1679. He was a Protestant by sympathy and was regarded as an available candidate for the throne. The Protestants aimed to raise him to the throne instead of the legal heir, James, Duke of York, but failed. During the reign of James II, Monmouth, at the instigation of William of Orange, organized what is known as Monmouth's Rebellion. The uprising is described vividly in Blackmore's *Lorna Doone* and in Conan Doyle's *Micah Clarke*. Monmouth, never a strong character, pleaded for his life but was executed. See JEFFREYS.

Monogram, two or more letters combined into a single character or device. It is usually a combination of the initials of a name used as a device for a seal, trade-mark, engraving on a piece of plate or a letter-head. The Romans stamped their coins not infrequently with a monogram. The monkish copiers of manuscripts were expert in devising and executing monograms as decorative head-pieces, etc. The correspondence of medieval diplomats was held lacking in taste unless decorated with monograms. The cutting of monograms, seals, and signet rings was almost an art in itself.

Monongahela River. See OHIO RIVER.

Monopoly, the exclusive right to sell or manufacture a certain article or class of goods. The undisputed right to buy and sell in an open market has not been granted universally. The authority to grant a favorite or a useful servant a monopoly has been a cherished privilege of monarchs and governments. In the days of "Good Queen Bess" the people groaned beneath the exactions of a horde of monopolists who had gained the ear of the sovereign and secured the exclusive sale of various necessities and luxuries. Honest tradesmen were driven from business. The people paid extortionate prices. Of course there was always some good reason to allege for granting an exclusive privilege. Inasmuch as "divers subjects of able bodies, which might go to plough, did employ themselves in the art of making cards," a monopoly to sell playing cards was granted. The exclusive privilege of selling starch was given on the score of preventing a waste of wheat—so on to the end of the list. Finally the abuse of monopolies became so great that Parliament took up the matter. Elizabeth's ministers defended the custom, but after acrimonious debate had run for four days, the queen, seeing that the issue was going against her, thanked Parliament for calling attention to grievous burdens of which she had been unaware. She made a clean sweep, abolishing all monopolies at a single blow. Yet under Charles I, so seductive is the principle of monopoly, and so capable is it of bringing corrupt influence to play, that soap, salt, and many other articles of prime necessity were again controlled by monopolies that undertook to pay sums into the public treasury for the privilege. Speaking of the holders of these monopolies, the historian Green quotes a member of Parliament: "They sup in our cup, they dip in our dish, they sit by our fire; we find them in the dye-vat, the wash-bowl, and the powdering tub. They share with the cutler in his box. They have marked and sealed us from head to foot."

Patents and copyrights are modern forms of monopoly. The granting of exclusive franchises to gas and electric light companies, street railway companies, and water companies is a prolongation of the monopoly system. The granting of licenses to sell liquor, especially in case but one saloon is licensed in a community, is the granting of monopoly on the old plea of "for the public good." In many countries there are government monopolies. In France and other nations, the government monopolizes the sale of tobacco. The Japanese government monopolizes the sale of camphor. Salt is not infrequently made a government monopoly. See TRUSTS.

Monotype, a machine for casting and setting type, as a substitute for composition by hand. The Lanston monotype machine, which is in use for book and job work, consists of two parts, one including the operating keyboard and the other a type-casting apparatus. The keyboard, like that of the linotype machine, resembles that of a typewriter, but has more than 250 keys. These correspond to all the characters in a font of type, with additional keys to inaugurate movements to be performed by the casting machine. By operating the keys, the compositor punches a series of holes in a moving strip of paper as the strip is unwound from one spool to another by means of compressed air or an electric motor. This perforated strip, when transferred to the casting machine, controls the movements of a matrix case containing bronze matrices, over a casting mold. The matrices for the letters and characters desired, as indicated by the perforations on the moving strip or ribbon of paper, are brought one after the other opposite the casting point by the matrix case or carrier, which is about three inches square. When the proper matrix is in position, an automatic wedge determines the size of the type with perfect accuracy, and a pump mechanism is operated which fills the mold and matrix with molten type metal. Thus each single type letter or character is separately cast. The matrix is then automatically lifted from the new-made type, and the type is passed into channel blocks, where the letters, etc., are assembled in lines. The matrix for the next letter or character is being placed in position over the mold while each type is being cast, and the operations follow each other rapidly, so that nearly 150 letters and characters can be cast and assembled in lines each minute. This machine is capable of setting and justifying lines of type in sizes from 5 point to 18 point, and will also cast type as large as 36 point for hand compositors' cases, as well as leads, slugs, rules, etc., up to 12 point.

The terms *linotype* and *monotype* are trade names for the respective machines, and indicate the character of their performance, the one setting and casting a line of type in one metal slug, convenient for handling, while the other sets and casts each letter or character separate from every other. See LINOTYPE.

Mono Rail. See STREET RAILWAY, subhead *Mono Rail.*

Monroe, James (1758-1831), the fifth President of the United States, was born in Westmoreland County, Virginia, and attended the College of William and Mary from 1774 until the opening of the Revolutionary War. He joined the army and was commissioned lieutenant of the Third Virginians. He served at Harlem Heights and White Plains and was wounded at Trenton. During 1777-78 Monroe served on the staff of the Earl of Stirling, with the rank of major. He fought at Brandywine, Germantown and Monmouth. In 1778 he was made lieutenant-colonel and was sent to Virginia to raise a regiment. Out of this commission grew his acquaintance with Thomas Jefferson, who at that time was governor of Virginia, and from then until the close of his career, the influence of Jefferson on Monroe was marked.

Monroe was elected to the Virginia legislature in 1782, and was a member of the Continental Congress from 1783 to 1786. He retired from Congress in 1786 and was again elected to the Virginia legislature. In 1788 he was a member of the Virginia convention called to ratify the Federal Constitution. In 1790 Monroe was called to fill a vacancy in the National Senate, and, in this body he stood out as a

vigorous Anti-Federalist and a consistent opponent of the Washington administration.

In 1794 Monroe was chosen by Washington to succeed Gouverneur Morris as the American representative in France. He reached France just after Robespierre had fallen from power, and was received by the Convention. In his speech to the Convention, Monroe characterized the Jay Treaty with England as a "shameful transaction," and made other remarks that were conducive to ill feeling between France and the United States. This speech and his subsequent actions and addresses resulted in his recall in 1796. This caused an outbreak of intense party feeling in the United States and Washington found offensive the pamphlet Monroe published in vindication of his actions in France. He retired from public life for three years.

His next appearance was as governor of Virginia, 1799. Thomas Jefferson was elected President in 1801, and in 1802 he sent Madison to France as assistant to Robert E. Livingston, who was to purchase New Orleans and the land about the mouth of the Mississippi River. This commission bought Louisiana, (See LOUISIANA PURCHASE) and Monroe was subsequently sent to England and to Spain. He concluded a treaty with England, but it was so unsatisfactory that it was never offered to the Senate for ratification. He was unsuccessful also in his attempt to secure Spain's cession of Florida.

Monroe returned to the United States in 1807, and as on the former occasion, he published a defense of his actions. He was again elected to the Virginia legislature, and was made governor of Virginia in 1811. In the same year he retired and accepted the office of Secretary of State in Madison's cabinet. This office he held until 1817, serving also as Secretary of War in 1814 and 1815. While still in office, 1816, he was elected President. He defeated Rufus King, the Federalist candidate, by 183 to 43 electoral votes.

The most important events of Monroe's administration—commonly called the "era of good feeling"—were the encouragement of development westward, the erection of adequate defenses on the Atlantic coast, the Seminole War, the Florida Purchase and the Missouri Compromise (See FLORIDA, subhead *History*; MISSOURI, same), and the establishment of definite relations with European powers regarding their attitudes toward South American affairs (See MONROE DOCTRINE).

One of Monroe's greatest ambitions was the development of the West, and during his Presidency he toured the country.

In 1820 he was reelected, receiving all but one electoral vote. This result was determined by the fact that with the death of the Federalist party, all party lines were for a time obliterated. It was during his annual address to Congress in 1822 that Monroe recommended the recognition of the independence of South American republics and laid the basis of the historic Monroe Doctrine.

See PRESIDENT:; MONROE DOCTRINE.

Monroe, La., the parish town of Ouachita Parish, is 155 miles northwest of Baton Rouge and 76 miles west of Vicksburg, Miss., on the Ouachita River. It is served by the St. Louis, Iron Mountain & Southern, Arkansas, Louisiana & Gulf and Vicksburg, Shreveport & Pacific railroads and by river steamers that ascend the Ouachita as far as Camden, Ark.

This city is the commercial center of a rich agricultural region, and does a large trade in cotton, lumber and fruit. It is on the border of the greatest natural gas field in the world in which are located twenty or more carbon plants manufacturing 80 per cent. of America's supply of carbon black from the natural gas. It has factories for the production of cottonseed oil and cake, fertilizer, bricks, automobile and wagon materials and other lumber products.

The most notable buildings are Saint Francis Sanitarium, the Federal and parish buildings, 11 story bank building and the schools. There is a large park and a salt water natatorium. Monroe is one of the oldest towns in Louisiana. The first settlement was made under the Spanish in 1785. Population, 1920, 12,675.

Monroe Doctrine, in American politics, a doctrine that European powers are not to

acquire territory in America and are not to interfere with the sovereignty of an independent state in the New World. The doctrine takes its name from certain sentences in President Monroe's annual message to Congress in December, 1823. John Quincy Adams, secretary of state, is credited with the real authorship. It was called forth by a popular belief that the European powers were contemplating interference in South America, in order to put a stop to the formation of republics and consequent loss of territory by Spain. The position taken by the United States government at this time was an encouragement to the struggling republics of South America. The doctrine was put to a practical test during the Civil War. Napoleon III placed Maximilian on the throne of Mexico by means of French bayonets. When the war was off our hands the French government was notified to withdraw its forces and did so.

As late as 1902 the German, English, and Italian governments united to bombard and occupy the ports of Venezuela in order to collect a debt which the authorities of that country refused to pay. Our government took the ground that it was no part of the Monroe Doctrine to protect an American republic from the payment of its just debts. The European powers concerned understood clearly, however, that they would not be permitted to seize territory or to occupy South American ports permanently. In accordance with the Monroe Doctrine, which means practically, "America for Americans," the nations of Europe recognized "the paramount interest" of the United States in the construction of a Panama Canal. No protest was raised against the acquisition by the United States of the territory and privileges requisite to the construction and control of the proposed canal. A discussion of the Monroe Doctrine has taken on a new phase ever since the Spanish-American War. The question of the extent to which our government may justly exclude Europe from participation in American affairs, and yet claim a seat the world's council, is one of international importance.

The Monroe Doctrine was more than a saucy command to the Old World to keep hands off the New. It was a protest against despotism.

For more than a century it has protected the western hemisphere from monarchism.

Our first and fundamental maxim should be never to entangle ourselves in the broils of Europe; our second, never to suffer Europe to intermeddle with cis-Atlantic affairs.—Jefferson.

Fellow-Citizens of the Senate and House of Representatives:

I. At the proposal of the Russian imperial government . . . a full power and instructions have been transmitted to the minister of the United States at St. Petersburg, to arrange, by amicable negotiation, the respective rights and interests of the two nations on the northwest coast of this continent. . . The occasion has been judged proper for asserting, as a principle in which the rights and interests of the United States are involved, *that the American continents, by the free and independent condition which they have assumed and maintain, are henceforth not to be considered as subjects for future colonization by any European powers.*

II. In the wars of the European powers, in matters relating to themselves, we have never taken any part, nor does it comport with our policy so to do. It is only when our rights are invaded, or seriously menaced, that we resent injuries or make preparations for our defence. With the movements in this hemisphere we are, of necessity, more immediately connected and by causes which must be obvious to all enlightened and impartial observers. The political system of the Allied Powers is essentially different in this respect from that of America. . . . We owe it, therefore, to candor and to the amicable relations existing between the United States and those Powers to declare *that we should consider any attempt on their part to extend their system to any portion of this hemisphere as dangerous to our peace and safety.* With the existing colonies or dependencies of any European power we have not interfered and shall not interfere. But with the governments who have declared their independence and maintained it, and whose independence we have, on great consideration and on just principles, acknowledged, we could not view any interposition for the purpose of oppressing them, or controlling in any other manner their destiny, by any European power, in any other light than as *the manifestation of an unfriendly disposition toward the United States.*—Monroe Message.

Monsoon, in India, a trade wind that has great influence on the climate. From May to September a steady air current laden with moisture from the Indian Ocean, sets in from the southwest. The western slope of Hindustan and the valleys of the great rivers receive the greatest rainfall at this period. One point in lower Burmah received 805 inches in a recent year. A

second monsoon from the northeast prevails from November to April. The monsoon region extends, with different dates, however, also to the Pacific as far as Japan. Before the application of steam to navigation the sailing master studied routes with reference to the direction and season of the monsoon. Steam has rendered him in a measure independent.

Montagu, Elizabeth Robinson (1720-1800), an English society leader. She was a native of York. Her husband, the Earl of Sandwich, died, leaving her a young widow with beauty and fortune. She devoted herself to literary pursuits—delighting in assembling literary people at her beautiful London home. She is said to be the original bluestocking. Among the people who frequented her parlors were Dr. Samuel Johnson, Burke, Garrick, Joshua Reynolds, Hannah More, Lord Lyttleton, Horace Walpole, and others. The subjects of this and the following sketch are of interest chiefly in connection with anecdotes of literary London.

Montagu, Lady Mary Wortley (1689-1762), an English writer. Her maiden name was Pierrepont. Her husband was a Whig officeholder under George I. Lady Montagu was a witty, entertaining woman of great beauty. Her home was the resort of the literary people of the day—Pope, Congreve, Addison, etc. In 1716 Montagu was appointed minister to Turkey. Lady Mary, who accompanied him, wrote home a series of *Turkish Letters* that created quite a sensation. A later quarrel with Pope occasioned much amusement. She is remembered in medical circles as an advocate of the Turkish system of inoculation for smallpox.

Montaigne, mon-tān′, **Michel Eyquem de** (1533-1592), a French essayist. He was born at the family chateau of Montaigne, near Bordeaux, France. He appears to have been educated thoroughly in the classics by private teachers. He attended also the college in Bordeaux in which Buchanan, the celebrated Scottish scholar, was at the time a professor. His youth was wild. He was for a time mayor of Bordeaux, a position which he appears to have filled with small credit. He was a great reader and became a noted writer. His reputation rests chiefly on his *Essays*. The first two books appeared in 1580 when he was forty-seven years old. They are lively, chatty, discussions of men, manners, and events, written without any pretension to the prevailing style of the period. The moral tone is that of the age in which he lived, with a vein of the skepticism for which French writers are noted. Montaigne's *Essays* are regarded as the beginning of modern essay writing. Montaigne has been more popular in England than in the United States. In *Representative Men* Emerson offers a valuable criticism of the man and his writings. A copy of the *Essays* with Shakespeare's name, the only book known to have been owned by him, is preserved in the British Museum. See BACON; EMERSON.

SAYINGS.

For a desperate disease a desperate cure.

A wise man never loses anything if he has himself.

Nothing is so firmly believed as what we least know.

There are some defeats more triumphant than victories.

How many worthy men have we seen survive their own reputations.

He who has not a good memory should never take upon him the trade of lying.

He who should teach men to die would at the same time teach them to live.

For truth itself has not the privilege to be spoken at all times and in all sorts.

I have here only made a nosegay of culled flowers, and have brought nothing of my own but the thread that ties them together.

The souls of emperors and cobblers are cast in the same mould. . . . The same reason that makes us wrangle with a neighbor causes a war between princes.

Montana, "The Treasure State," one of the north mountain states bordering on the Dominion of Canada and having for its northern boundary Alberta and Saskatchewan. North and South Dakota lie on the east, Wyoming and Idaho on the south and Idaho on the west. The greatest length from east to west is 540 miles and the average width from north to south is 275 miles. The area is 147,182 square miles, making Montana the third state in the Union in size, being exceeded in area by Texas and California.

SURFACE AND DRAINAGE. East of the Rocky Mountains the surface consists chiefly of rolling prairies which gradually rise to meet the foothills. Occasional low

bluffs or buttes are found along the streams and some of these have been worn by the winds into fantastic forms. The Rocky Mountains enter the state from Yellowstone Park and extend across it in a northwesterly direction. One hundred miles west of these mountains the Bitter Root range forms the larger part of the boundary between Montana and Idaho. Between these mountain ranges is a broad valley greatly diversified by cross ranges and hills, and forming a region remarkable for the beauty and grandeur of its scenery. In the northwestern part of the state is Glacier National Park, one of the American wonderlands. The state as a whole has a high altitude, no section being lower than 1,000 feet,—and there are numerous mountain peaks which attain an altitude of 10,000 feet or more. The name "Montana" is derived from the Spanish and means "mountains."

The Rocky Mountains form a divide, separating the rivers which flow eastward from those which flow into the Columbia and thence into the Pacific Ocean. The Missouri is the most important stream of the state and with its tributaries, the Musselshell, the Yellowstone and Milk from the north drains all of the state east of the Rocky Mountains. Flathead Lake, in the northwestern part of the state, is the only large body of water within its boundaries.

Climate. Montana has a continental climate which is characterized by extremes of heat and cold. During the winter the thermometer often falls as low as 40° below zero and during the summer it may rise to 100° above. The atmosphere is clear and dry and this condition combined with the altitude affords relief from the intense heat. The winters are tempered by the Chinook (which see) a warm wind which comes down the mountains. The rainfall in the east is about 15 inches, which increases to 20 inches in the mountain regions and more in the extreme northwest.

Minerals. Because of its great mineral wealth Montana was popularly named the "Treasure State." The discovery of gold in the region in 1861 attracted settlers, but later the great copper region was discovered and gold soon yielded in importance to copper. For a number of years, previous to 1906, Montana was the leading state of the Union in the production of this metal, then Arizona took first place. One of the great copper mining regions in the world is about Butte and Anaconda. In normal years the value of the state's output of copper is about $8,000,000, and it is estimated that since the beginning of copper mining in Montana that state has produced about one-third of the copper produced in the United States.

Silver ranks next in importance and is mined in a number of places. However, a large amount of silver is recovered in the reduction of copper ore. The output of silver in 1921 was $1,670,000. Lead, zinc and coal are also mined in paying quantities. There are sapphire mines near Great Falls and in one or two other localities, and Montana leads the world in the production of this precious stone. There are extensive deposits of lignite and bituminous coal in the eastern part of the state, the area extending from the eastern boundary as far as Billings, and coal mining is increasing from year to year.

Forests. The forests of Montana have an area of 42,000 square miles, practically equal to that of the state of Pennsylvania. The great forest region is in the western part of the state, where the mountains and foothills are heavily forested up to the tree line. The trees found in largest numbers are yellow pine, white pine, white fir, red fir, larch and hemlock. Yellow pine often attains large size and is a valuable source of lumber.

Agriculture. According to the census of 1920 there were 57,677 farms in Montana and over one-third of the acreage was improved. The rolling prairie and bottom lands contain a rich soil which produces abundant crops of all cereals and vegetables grown in a cool temperate climate. By resorting to dry farming large areas of this region have been brought into tillage, in addition to the areas under irrigation. The most important cereal crops are wheat, oats and corn. Large quantities of hay are cured, and flax, potatoes and sugar beets are important. Apples and other orchard fruits, as well as small fruits, are produced

in large quantities in the mountain valleys.

Formerly the rolling prairies pastured thousands of cattle and sheep on open ranges, but most of these ranges have been changed to fenced ranches and more attention is now given to high grade cattle and horses than to raising a large number of inferior animals. For a number of years Montana was the leading state in the Union in the production of wool, but since the ranges have been broken up the number of sheep has diminished, and the state is now passed in wool production by Texas and Wyoming. In some regions especial attention is given to the raising of horses, and Miles City has become one of the most important horse markets in the West.

IRRIGATION. Montana contains extensive irrigation works, and nearly one-third the farm acreage is irrigated. However the irrigated region is confined almost entirely to the mountainous section of the state. Important projects are located at Huntley, on the Milk River, on the Sun River and on the Yellowstone. There is another at Flathead Lake and others at Fort Peck and on the Blackfeet Reservation, the latter for the benefit of Indians.

MANUFACTURES. The census of 1920 gave the following data concerning manufactories organized under the factory system:

Number of establishments	1,290
Persons engaged	20,692
Primary horse power	170,206
Capital invested	$137,476,277
Cost of material	$122,151,294
Value of products	$166,664,518

Hydro-electric plants in 1920 had a capacity of 300,000 horse power, most of this was used for the operation of electric trains. The rivers of the state are capable, when developed, of producing much greater power than is available at present and this, with the abundance of raw material, leads to a hopeful future for manufacturing in Montana. The leading industries in 1920 were lumber and lumber products, the manufacture of flour, production of butter and cheese and the canning of fruits and vegetables.

TRANSPORTATION. Three great trunk lines of railway—the Great Northern, in the north, the Chicago, Milwaukee & St. Paul, in the center, and the Northern Pacific in the south—traverse the state from east to west. Numerous spurs and cross lines connect these main lines at various points, and the Oregon Short Line enters the state from Idaho. The Chicago, Burlington & Quincy connects with the Northern Pacific at Livingston, from which station a line extends southward to the entrance of Yellowstone Park. There are, however, many regions yet remote from railways and dependent entirely upon teams or motor trucks.

POPULATION. In 1920 Montana had a population of 548,889, an increase of 172,836, or 46 per cent., during the decade. The urban population was 31.3 per cent. and the rural 68.7 per cent. in 1920, and in 1910 the urban population was 35.5 per cent. and the rural 64.5. In 1920 there were twelve cities with a population of 5,000 or more.

EDUCATION. In 1920, the Russell Sage Foundation gave Montana first rank in the public school system of the United States. The entire system is under the supervision of a state board of education with a state superintendent of public instruction at the head. In 1921 the state public school fund amounted to about 20 million dollars. Since this fund is derived from the sale of school lands, it is increasing from year to year. The income from this fund is supplemented by taxes raised by uniform levy on all taxable property within each county. These funds (both state and county) are apportioned to school districts on the basis of the school census (children six to twenty-one years of age). Additional school funds are raised by local taxes in each individual district. A strong compulsory education law is an important factor in reducing illiteracy. The state institutions at the head of the educational system are the University of Montana, at Missoula, the College of Agriculture and Mechanic Arts, at Bozeman, the School of Mines, at Butte, and the State Normal College, at Dillon. These four institutions are under the administration of one head, bearing the title of chancellor of the University of Montana. Among other educational institutions are the Montana Wes-

leyan University at Helena, the Polytechnic Institute at Billings, and Mt. St. Charles College at Helena.

The University of Montana was opened at Missoula in 1895. It is coeducational and offers courses in literature and arts, science, law, pharmacy, forestry, journalism, domestic science, music, commerce and accounting. It also maintains a school of education and a university extension department, through which courses may be given by correspondence. A summer school is maintained, chiefly for the benefit of teachers. The faculty numbers 75 and the enrollment exceeds 1,200.

INSTITUTIONS. There is a state orphan home at Twin Bridges, a soldiers' home at Columbia Falls, a school for the deaf, dumb and blind and feeble-minded at Boulder and a hospital for the insane at Warm Springs. The state penitentiary is at Deer Lodge, there is a reformatory for boys, known as the state industrial school at Miles City, and a state vocational school for girls (reformatory) at Helena.

GOVERNMENT. Montana has had only one constitution, which was adopted in 1889 when the state was admitted to the Union. Amendments adopted are, one, in 1906, providing for the initiative and referendum; another, in 1914, granting a franchise to women on the same terms as men. As a result of the latter amendment Miss Jeanette Rankin was elected to the National House of Representatives in November 1916, being the first woman to take her place in the National Congress. Besides these two, an amendment was passed in 1920 providing that income from school funds must not be spent except for schools, and in 1922 an amendment providing for a state board of equalization composed of appointed tax experts. There have also been eight other amendments of minor importance.

The executive department comprises the governor, secretary of state, attorney-general, treasurer, auditor and superintendent of public instruction, all elected for four years.

The legislative department consists of a senate and a house of representatives. The representatives are elected for two years, and the senators, one from each county, for four years. One-half of the senators being elected every two years. The legislative sessions are biennial and are limited to 60 days.

The judicial department consists of a supreme court, judges of which are elected for six years, and district courts whose judges are elected for four years. Petty cases are adjudicated by courts of justices of the peace.

HISTORY. The territory included within the state of Montana was a part of the Louisiana Purchase. The Lewis and Clark Expedition crossed the western part of the state in 1804-5, but no permanent settlement was made until 1846, when the American Fur Company established their post at Fort Benton. The discovery of gold in 1861 led to a rush of prospectors to the mountains and mining settlements rapidly sprang up. Montana was included in the Territory of Idaho when it was organized in 1863. The following year, however, it was established as a separate territory. In 1874 the capital was located at Helena and 1876 occurred the battle between General Custer and the Sioux in which Custer's forces were completely annihilated. At about this time the deposits of copper around Butte were discovered and from 1880 to the present time copper mining has been an important industry. In 1883 the Northern Pacific railroad was completed and this was a great aid in the economic development of the state. Montana was admitted to the Union in 1889, becoming the forty-first state. With the exception of occasional labor troubles in the mining regions, the history of the state has been one of steady progress and prosperity. During the World War Montana supplied 40,000 soldiers and subscribed over $87,400,000 to Liberty bonds.

STATISTICS. The following are the latest statistics to be had from trustworthy sources:

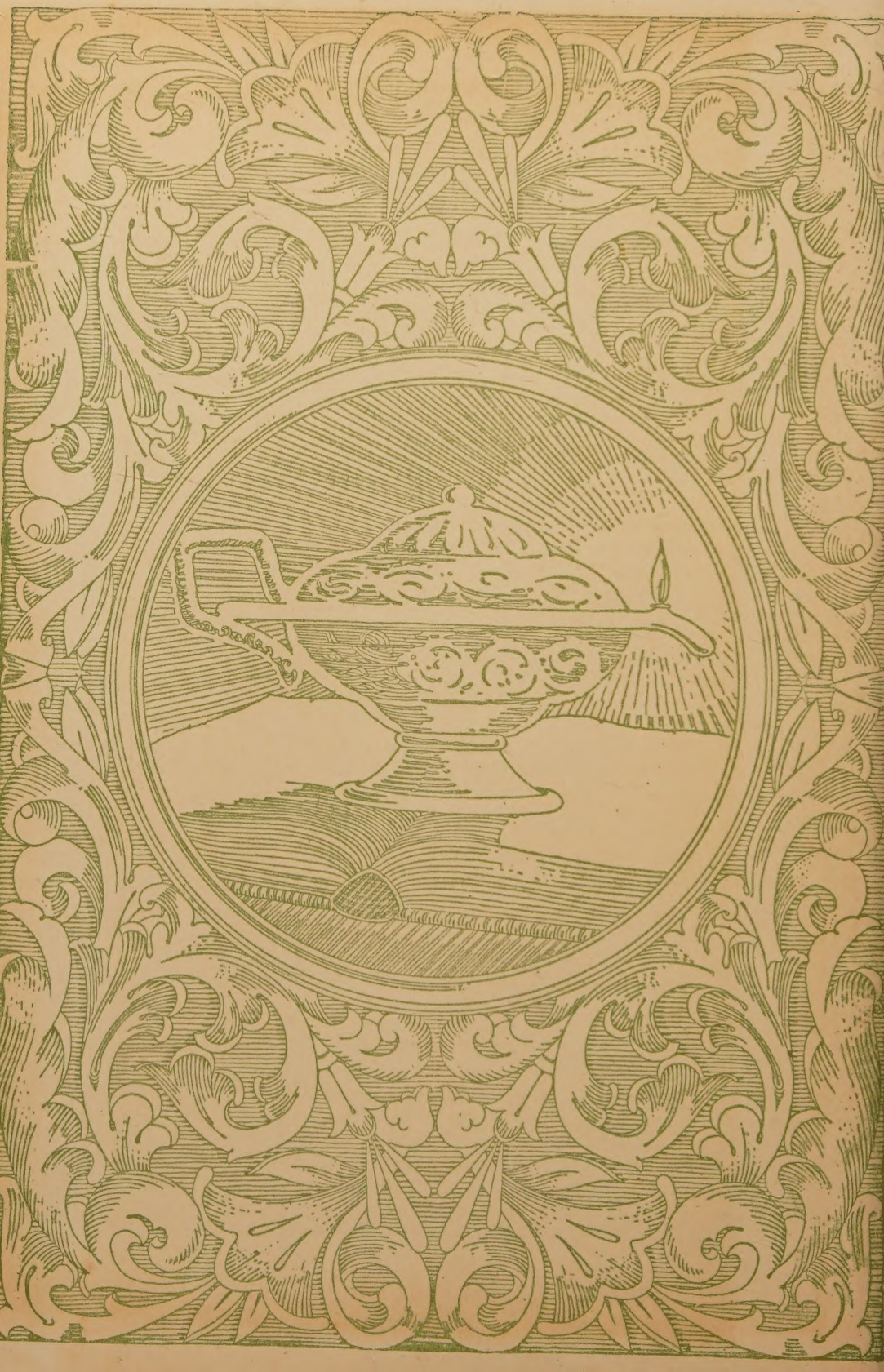
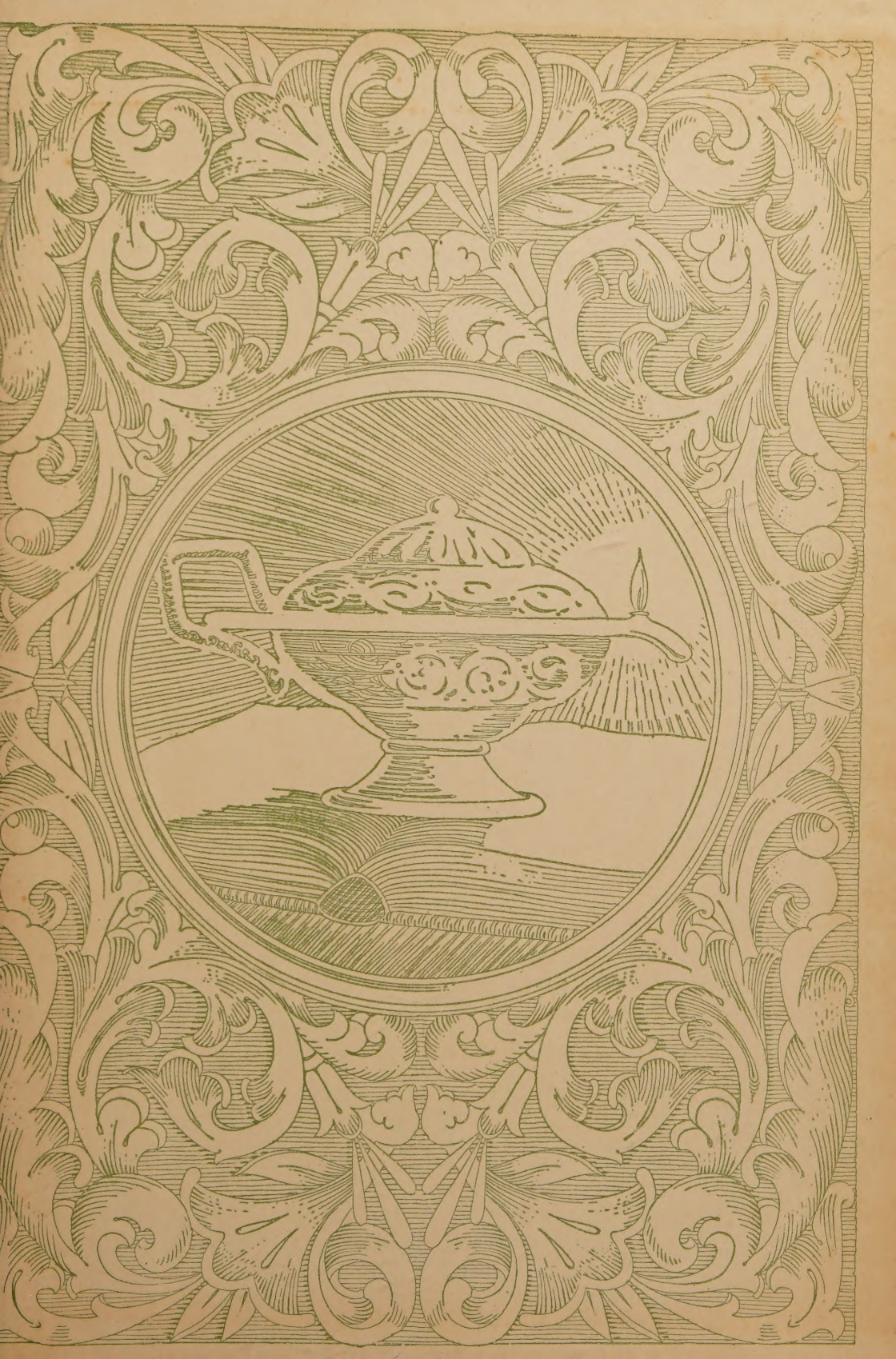
Land area, square miles	146,386
Water area, squares miles	796
Forest area, acres	11,000,000
Irrigated area, acres	1,681,729
Population (1920)	548,899
White	534,260
Negro	1,658

Asiatic	2,015
Indian	10,956
Foreign born	93,620
Chief cities:	
Butte	41,611
Great Falls	24,121
Billings	15,100
Missoula	12,668
Helena	12,037
Number of counties	54
Members of state senate	54
Members of house of representatives	107
Salary of governor	$7,500
Representatives in Congress	4
Assessed valuation of property	$1,582,356,676
Bonded indebtedness	$6,077,576
Farm area, acres	35,070,656
Improved land, acres	11,007,278
Wheat, bushels	28,168,000
Oats, bushels	10,787,000
Corn, bushels	2,560,000
Barley, bushels	1,200,000
Flax seed, bushels	1,125,000
Potatoes, bushels	5,060,000
Hay, tons	2,407,000
Wool, pounds	15,800,000
Domestic animals:	
Horses	520,000
Milk cows	185,000
Other cattle	918,000
Sheep	2,450,000
Swine	200,000
Manufacturing establishments	1,290
Capital invested	$137,476,277
Operatives	17,160
Raw material used	$122,151,294
Output of manufactures	$166,664,518
Copper, pounds	$180,240,000
Coal, tons	2,768,000
Silves, ounces	9,677,020
Gold, ounces	83,476
Miles of railway	7,196
Teachers in public schools	6,215
Pupils enrolled	126,238

Montcalm, mŏnt-kăm, **Louis Joseph de Saint Véran** (1712-1759), a French soldier. He was born near Nimes. He entered the army at the age of fourteen, won distinction in the War of the Austrian Succession and by 1756 had attained the rank of brigadier-general. This date, 1756, marks the beginning of the Seven Years' War in Europe and the French and Indian War in the New World. Montcalm was appointed to command the French troops in Canada. For three years he carried on active operations against the English with considerable success despite the difficulties arising from lack of food and other supplies, from dissensions with the governor of Canada, and from want of decisive action on the part of the home government. In July, 1759, he repulsed an attack of the English under General Wolfe in Quebec, but a second attack, in September, of the same year, was successful and Montcalm was mortally wounded.

Monte Carlo, a noted European gambling resort. See MONACO.

Montenegro, formerly an independent European kingdom. King Nicholas I was deposed in 1918. By the Peace Treaty it became a part of the new state of Jugo-Slavia. There are many mountain ridges and peaks, with fertile plains and valleys. The mountain sides are covered with oak, holly, ash, poplar, willow, alder, beech, and fir. The copses yield hazel-nuts and walnuts. Sumach for tanning is gathered. The fertile areas produce Indian corn, cabbage, cauliflower, potatoes, and tobacco. Orchard trees bear apples, peaches, olives, pomegranates, figs, quinces, and almonds. The mulberry tree and the vine flourish. The Lake of Scutari, the largest in the Balkans, affords carp-fishing. Smoked carp is an article of commerce. Large trout are taken in the mountain streams. Cattle, sheep, goats, and pigs run in the forests and on the mountain sides. Wool, smoked meats, honey, wax, hides, tallow, butter, and cheese are exported. The chief imports are tobacco, salt, wine, coffee, sugar, and implements.

Montenegro was a part of ancient Illyria, and in the Middle Ages it was a part of the Slavonic kingdom of Servia. Like other Balkan states, Montenegro was subjected by the Turks. In 1697 the Prince-bishop shook off the Turkish yoke and placed the country under the protection of Russia. In 1878 entire independence was agreed to by the signatory powers to the Treaty of Berlin. The capital was the village of Cettinje.

The area of Montenegro (1920), as part of the Jugoslav state, is 3,536 square miles and the population is about 238,500. The population of Cettinji is 5,500. The Montenegrins are an erect, robust mountain people. They profess the Greek religion and speak the Slavonic tongue.